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The purpose of this study was to determine the relationships among monetary incentives, performance, job satisfaction, and perceived stress. Performance and incentives were hypothesized to relate positively to job satisfaction, intrinsic job satisfaction, and stress, with the exception of the stress element boredom, which was expected to relate negatively to performance and incentives. In an organizational simulation, 129 employees were randomly assigned to groups that differed in the magnitude of incentive offered for performance above a predetermined standard. Control groups performed either without a standard or against the standard but without incentives. There was a positive relationship between incentives (versus no incentives) and satisfaction, as well as between performance and satisfaction. Intrinsic job satisfaction was also related to incentives. Stress was related to both incentives and performance, but the nature of this relationship was complex, with various stress elements relating or tending to relate either positively or negatively. As predicted, boredom was related negatively to both incentives and performance. None of the elements of job satisfaction or stress exhibited the expected relationships with the level of incentive offered. Implications for future research are discussed and conclusions presented.

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22a. NAME OF RESPONSIBLE INDIVIDUAL Barrie L. Cooper	22b. TELEPHONE (include Area Code) (619) 225-6935	22c. OFFICE SYMBOL Code 41

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Incentive Magnitude, Job Satisfaction, Perceived Stress, and Performance: Interrelationships in an Organizational Simulation

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July 1987

INCENTIVE MAGNITUDE, JOB SATISFACTION, PERCEIVED STRESS, AND PERFORMANCE: INTERRELATIONSHIPS IN AN ORGANIZATIONAL SIMULATION

Barrie L. Cooper
Delbert M. Nebeker
James A. Riedel

Approved by
Richard C. Sorenson

Released by
B. E. Bacon
Captain, U.S. Navy
Commanding Officer

and

James S. McMichael
Technical Director

Navy Personnel Research and Development Center
San Diego, California 92152-6800

FOREWORD

The purpose of this research and development, which was conducted under Work Unit 521-804-018 (Improving Individual and Unit Productivity), was to investigate the relationships of incentives and performance to job satisfaction and stress. A companion report, NPRDC TR 87-30, reviewed the literature relating to organizational stress. Other research conducted under this Work Unit investigated the influence of monetary incentives on performance and goal setting (NPRDC TR 87-15), and the influence of task strategies on performance (HFOSL TN 72-86-05).

Much appreciation is expressed to Dr. B. C. Tatum, who, in addition to the authors, worked to bring this project to a successful completion. Appreciation is also extended to Dr. Ross Vickers of the Naval Health Research Center, who provided valuable suggestions for approaches to the study of stress.

Requests for further information concerning this review of stress in organizations should be directed to Barrie L. Cooper, Navy Personnel Research and Development Center, AUTOVON 933-6935 or Commercial 619-225-6935.

B. E. BACON
Captain, U.S. Navy
Commanding Officer

JAMES S. McMICHAEL
Technical Director

SUMMARY

Problem

The level of productivity growth in the United States required to maintain our standard of living, provide for the national defense, and reduce the federal deficit can be realized only through increased efforts by organizations to improve their efficiency. At the individual level, attempts to improve productivity have generally included efforts to improve employee performance. This desired increase in productivity can, however, yield unintended outcomes. As a result, paralleling this increased productivity emphasis has been an increased interest in the mix of positive and negative effects of work and the work environment on the individual employee. Two areas of particular interest to researchers in recent years have been job satisfaction and job stress.

Purpose

The purpose of this study was to determine the relationships among monetary incentives, performance, job satisfaction, and perceived stress. The potential of monetary incentives to increase performance, together with their use in a broad spectrum of industries, has made incentives an important factor in the study of job satisfaction and stress. The current interest in productivity improvement makes the study of incentives doubly important.

Method

The method of research chosen for this study was an organizational simulation. Employees were recruited to work part-time on a clerical task. Applicants were randomly assigned to one of seven work shifts, or groups, with each group having a maximum of 20 employees. In addition to a base salary of $4.40 per hour paid to all employees, those in five of the seven groups could earn varying amounts of incentive pay for performance exceeding a predetermined standard. The level, or sharing rate, of the incentive was different in each of these five groups. The remaining two work groups served as controls.

Results

Multivariate analyses of variance (MANOVAs) and covariance (MANCOVAs) tested the relationships between incentive conditions and performance, on the one hand, and the elements of job satisfaction and perceived stress, on the other. There was support for a positive relationship between job satisfaction and the opportunity to earn incentives, as well as between job satisfaction and performance. Intrinsic job satisfaction, defined as a sense of pride and accomplishment in performing one's work, was also positively related to the opportunity to earn incentives. There was no support for the hypothesized positive relationship between level of incentive and either overall job satisfaction or intrinsic job satisfaction.

Perceived stress was related to both the opportunity to earn incentives and performance, but the nature of this relationship was complex, with the various stress elements exhibiting positive or negative relationships or tendencies. Boredom was negatively related to both the opportunity to earn incentives and performance. None of the elements of stress were related to incentive level.

Conclusions

1. The introduction of monetary incentives into the workplace is associated with greater overall job satisfaction. Incentives are also related to an increase in intrinsic job satisfaction, satisfaction with the job itself, and pay satisfaction.

2. Higher employee performance is associated with greater overall job satisfaction, satisfaction with the job itself, and pay satisfaction.

3. Monetary incentives and higher employee performance are related to elements of perceived stress, though some elements are positively and some negatively related. Boredom is negatively related to both monetary incentives and higher performance.

4. No consistent relationship could be demonstrated between the level of incentive offered and either job satisfaction or perceived stress.

Recommendations

1. All Navy activities with existing monetary incentive programs should be cognizant of the effects of these programs on employee job satisfaction and perceived stress. Aspects of these programs suspected of substantially increasing employee stress or reducing job satisfaction should be modified to return satisfaction and stress to acceptable levels.

2. Navy activities implementing new monetary incentive programs should design them to align organizational goals with employee outcomes so that goals and job satisfaction can be jointly optimized, while perceived stress is minimized.

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INTRODUCTION

Problem

The level of productivity growth in the United States required to maintain our standard of living, provide for the national defense, and reduce the federal deficit can be realized only through increased efforts by organizations to improve their efficiency. These efforts are likely to include organizational-level actions such as capital improvements, improved selection and placement, and tighter financial management. Individual level actions have included efforts to improve employee performance (Hunter & Schmidt, 1983; Katzell & Guzzo, 1983; Tuttle, 1983). Productivity is not the only concern, however. Increased organizational emphasis on productivity can also yield important individual outcomes, some of which are unintended. Accordingly, paralleling this increased productivity emphasis has been increased concern over the mix of positive and negative effects of work and the work environment on the individual employee. Two areas of particular concern in recent years have been job satisfaction and job stress.

The reasons for concern over job satisfaction are self-evident. No one, including the employer, could reasonably argue against the employee's desire, all things being equal, to attain work satisfaction. Therefore, research into the causes and correlates of job satisfaction has obvious value to employer and employee alike.

The study of job stress, on the other hand, is a more complex proposition. Most of us can think of job situations that have felt "stressful" to us. We can also imagine how this stress could have been reduced in some way. But we may be inclined to believe that stress is the unavoidable result of the often conflicting interests of the employer and employee. With the current interest in increasing productivity, we may feel there is no alternative to stressful conditions in the workplace.

Interest in stress has found its way out of the laboratories, hospitals, and clinics into the layman's and businessman's world. A recent article in *Time* spoke of the "stress epidemic" (Wallis, 1983, p. 48). This and other recent articles (e.g., Barnett, 1983; Guenther, 1982; "High Stress States," 1983; Ricklefs, 1982; "Stress is More Severe," 1983; Waldholz, 1982) have helped make the American public more aware of stress.

Purpose

In light of these developments, the challenge for researchers is to understand the relationships between productivity enhancement actions and the outcomes of job satisfaction and job stress. A recent review identified monetary incentives, goal setting, job enrichment, and participative management as productivity enhancement methods often used by businesses and studied by organizational researchers (Locke, Feren, McCaleb, Shaw, & Denny, 1980). Of these four, monetary incentives were found to have produced the greatest performance increases.

The potential of monetary incentives to increase performance, together with their use in a broad spectrum of industries (Fein, 1982), makes incentives an important factor in the study of job satisfaction and stress. The current interest in productivity improvement makes the study of these variables doubly important. This study, therefore, investigates the relationships of incentives and the resulting performance to job satisfaction and perceived stress.

Background

Job Satisfaction

The bulk of recent job satisfaction research has concluded that satisfaction results from one or more work-related variables (e.g., Arvey & Dewhirst, 1976; Bem, 1972; Katz & Van Maanen, 1977; Locke, 1970; Steers, 1976; White, Mitchell, & Bell, 1977). There still are, however, conflicting findings concerning the organizational variables that are related to job satisfaction, their relative strengths, and their proximal relationships. Two variables that have been investigated in relation to job satisfaction are incentives and performance.

Twenty years ago, Opsahl and Dunnette (1966), in their review of research and theory of financial incentives, lamented the lack of research in this area. In an analysis of several surveys, Lawler (1971) found that the importance of pay ranked an average of third among workers in the United States. Yet, regrettably, incentives research in the intervening period has continued to lag behind other areas of organizational research.

Perhaps the difficulty and expense of conducting such research have deterred some investigators. Incentives research in the field is hampered by a number of potential problems. Implementing incentive programs is a major undertaking of considerable expense, so implementation requires thorough planning and strong organizational commitment. In addition, conflicting organizational priorities and research goals make it extremely difficult to conduct experimental or quasi-experimental research in the field. Finally, in organizations with union employees, the proposal to use monetary incentives to boost production can elicit a negative union response, and thus make such a program very difficult to implement.

Laboratory experiments have often been used, therefore, to study the effects of pay incentives. These experiments, however, have typically rewarded subjects with trivial amounts of money, have lasted only a few hours, and have lacked realism (e.g., Cherrington, Reitz, & Scott, 1971; Fowles, Fisher, & Tranel, 1982; Tranel, 1983; Tranel, Fisher, & Fowles, 1982), casting doubt on the generalizability of the findings.

In their incentives review, Opsahl and Dunnette (1966) reviewed major theories of the role of money in motivation. They expressed a preference for Vroom's (1964) view of money as a means of obtaining valued outcomes. Certainly this view is consistent with recent findings from expectancy theory research that grew out of Vroom's work (Ilgen, Nebeker, & Pritchard, 1981; Nebeker, Dockstader, & Shumate, 1978).

The effects of incentives on performance are well-established. As mentioned above, in a review of the effects of incentives on performance, goal setting, participative decision making, and job enrichment, Locke et al. (1980) concluded that incentives had the largest positive effect on performance. Katzell and Yankelovich (1975), in a review of 300 studies on motivation and job satisfaction, found that financial incentives were the most effective way to improve both motivation and satisfaction.

Some reviewers have maintained that pay causes increases in both performance and satisfaction (Brayfield & Crockett, 1955; Fournet, Distefano, & Pryer, 1966). Lawler (1971, 1981) concluded that contingent pay can lead to greater pay satisfaction. Similarly, Cherrington et al. (1971) determined from their research that the relationship

between performance and job satisfaction is dependent on performance-contingent rewards.

In examining causality among merit pay, performance, and satisfaction, Greene (1973) used cross-lagged correlations in determining that merit pay causes satisfaction, but found only limited support for the hypothesis that performance causes satisfaction. However, performance and merit pay combined to increase the prediction of satisfaction. There was no support for the hypothesis that merit pay causes improved performance, but there was support for reciprocal causation.

Several recent studies have found amount of pay to be positively related to pay satisfaction or job satisfaction (Dyer & Theriault, 1976; Katz & Van Maanen, 1977; Katzell & Yankelovich, 1975). These findings are not without contradiction, however. In a test of this proposition, Berger and Schwab (1980) designed an experiment to test the effects of pay level and incentive level on pay satisfaction. The results indicated that pay level, but not level of incentive earned, had a significant effect on pay satisfaction.

In a study of supervisors and administrators, Podsakoff, Todor, and Skov (1982) found that contingent rewards (recognition, acknowledgement, and commendations) correlated with performance ratings and all aspects of job satisfaction. Not surprisingly, such contingent rewards were strongly related to satisfaction with one's supervisor ($r = .68$, $p < .001$). By inference, one would expect that contingent monetary rewards would correlate most highly with pay satisfaction. This correlation was, in fact, found in a laboratory experiment (Wimperis & Farr, 1979) in which contingent pay had a significant effect on both quantitative performance and pay satisfaction (labeled by the experimenters as extrinsic motivation for money).

Several researchers have found that job success, which can be considered an analogue to performance, was related to job satisfaction (Korman, 1976; Locke, 1965, 1966a, 1966b, 1967; Porac, Nottenburg, & Eggert, 1981). Slocum (1970) reported that performance among mid-level and lower-level supervisors was significantly, though moderately, related to job satisfaction. Some investigators have found that this performance-satisfaction relationship is mediated by the intrinsic and extrinsic rewards earned (Lawler & Porter, 1967; Porter & Lawler, 1968; Slocum, 1971).

In a review of the relationship between performance and satisfaction, Schwab and Cummings (1970) presented evidence regarding these two variables: both the performance-causes-satisfaction model and the performance-and-satisfaction-as-outcomes model found adherents. Each view, however, recognized the influence of other variables.

In sum, there is support for the positive relationship between monetary incentives and job satisfaction, and for the positive relationship between performance and satisfaction when performance-contingent incentives are awarded.

Despite some evidence that global, or facet-free, job satisfaction (as in the question, "Overall, how do you like your job?") is not the same as the sum of satisfaction with separate job facets (Quinn & Staines, 1979), most researchers have conceptualized and operationalized job satisfaction as the sum of satisfaction with the various facets of the job (Wanous & Lawler, 1972).

Reviews that discussed job satisfaction research have recognized the fact that job satisfaction is defined most frequently in the literature as consisting of five factors: satisfaction with the work itself, pay satisfaction, promotion satisfaction, supervision satisfaction, and co-worker satisfaction (Belcher & Atchison, 1976; Schwab & Cummings, 1970). With the exception of promotion satisfaction, which is not applicable to this study, overall job satisfaction will be defined here as the cluster of the commonly accepted job satisfaction factors or elements, along with measures of intrinsic job satisfaction.

Intrinsic Job Satisfaction

In a series of experiments, Deci (1971, 1972a, 1972b) examined the effects of "extrinsic" rewards on "intrinsic" motivation and satisfaction. In these studies, subjects given money contingent on performance (defined by Deci as an extrinsic reward) experienced a decrease in intrinsic motivation as compared with their intrinsic motivation during a baseline period, while subjects given positive feedback and verbal reinforcement (defined as intrinsic rewards) experienced an increase in intrinsic motivation over the baseline period. Deci concluded, therefore, that contingent extrinsic rewards decrease intrinsic motivation, and that intrinsic and extrinsic rewards are not additive. This conclusion is in direct contradiction to the predictions of expectancy theory (Ilgen, Nebeker, & Pritchard, 1981; Nebeker et al., 1978).

In a critique of Deci's (1975) cognitive evaluation theory of extrinsic motivation, Scott (1975) found no evidence that "extrinsic" rewards reduce "intrinsic" motivation, and he criticized the term "intrinsic motivation" as unclear. Staw (1976) pointed out that expectancy models of motivation presume that the motivating effects of intrinsic and extrinsic rewards are additive and that, according to expectancy theory, extrinsic rewards should increase a person's intrinsic interest in the task. In fact, the expectancy model does not address the way in which extrinsic, as opposed to intrinsic, rewards acquire a motivating force. It is conceivable that one individual may view an acquired motivator, such as money, as intrinsically motivating, while another may see it as extrinsic.

Staw (1976) observed that, in contrast to voluntary organizations, the administration of "extrinsic" (pay) rewards in a business setting is an expected and necessary means of operating, and provides the basis for performing work that may not be "intrinsically" interesting. Furthermore, Staw pointed out, there is a strong norm for payment in work situations, whether the work is intrinsically interesting or not.

In a laboratory study testing Staw's (1976) observations, subjects were informed either that payment was, or was not, the norm for participating in an experiment (Staw, Calder, Hess, & Sandelands, 1980). In the norm-for-no-payment condition, payment of money led to lower intrinsic job satisfaction than nonpayment. In the norm-for-payment condition, however, nonpayment of money led to lower satisfaction than payment. A work simulation conducted by Hamner and Foster (1975) supported the view that intrinsic rewards and contingent extrinsic rewards combine to predict greater job interest, as expectancy theory predicts.

A further criticism of Deci's (1975) theory is the division of intrinsic and extrinsic rewards. It has been observed (Broedling, 1977; Dyer & Parker, 1975) that the intrinsic-extrinsic distinction is open to several different definitions and classifications. Specifically, this distinction may be considered a trait of the individual, a situational state, or an interaction between the individual and the situation (Broedling, 1977). Any

acceptance of the intrinsic-extrinsic distinction as situationally determined requires concomitant acceptance that intrinsic and extrinsic motivation and satisfaction may change with time and environmental conditions. Andrisani and Miljus (1977) found that differing preferences for intrinsic (work content) and extrinsic (contextual) aspects of work are related to age, race, education, occupation, and job satisfaction. Might not these differing preferences be explained just as well as differences in what people find "intrinsically" motivating or satisfying?

In spite of this lack of agreement regarding the content or, indeed, the validity of the construct known as intrinsic job satisfaction, this study will define intrinsic job satisfaction as a sense of pride and accomplishment from performing the work.

Perceived Stress

Stress has been the topic of a great deal of research in recent years, yet there is still disagreement as to its definition, as recent reviews have indicated (Beehr & Newman, 1978; McGrath, 1976; Schuler, 1980, 1982; Sharit & Salvendy, 1982; Shirom, 1982). Selye (1976), who pioneered the study of stress, has admitted causing some of the confusion by using the term "stress" to designate both the causal agent and the bodily effect. He has argued that stress should be considered the effect, and the coined word "stressor" should designate the causal agent (Selye, 1975, 1976). Others, following the model of the physical sciences, have defined "stress" as the external force and "strain" as the resulting change in the bodily system (Caplan, 1972; French & Caplan, 1972; French, Caplan, & Harrison, 1982; Hall & Mansfield, 1971).

Schuler (1980), in his review, recognized the multifaceted nature of stress, which he defined as a condition in which an individual is faced with either an opportunity, constraint, or demand on being, having, or doing what is desired in a situation of uncertainty, which, when resolved, leads to important outcomes for the individual. Schuler's use of the term "desire" is deliberate, signifying that individuals have differing values and needs that are not satisfied equally by identical environmental influences. Each type of stress was theorized to relate positively to cognitive psychological outcomes. Opportunity stress was theorized to be positively related to affective psychological outcomes, such as job satisfaction. Opportunity stress and constraint stress were theorized to have inverted-U relationships with performance, and demand stress a negative relationship with performance. While this is a useful categorization of stress, there are practical difficulties with Schuler's conceptualization, the primary one being that one person's demand could be another's opportunity, or another's constraint. Or a situation could represent each of the three types of stress for the same person at different times. Further, this categorization is an oversimplification of the multifactorial nature of stress. Categorization of stress in this manner would likely inhibit explanation and understanding of the complex interactions between the individual and the environment.

McGrath (1976) viewed stress as a potential occurrence "when an environmental situation is perceived as presenting a demand which threatens to exceed the person's capabilities and resources for meeting it, under conditions where he expects a substantial differential in the rewards and costs from meeting the demand versus not meeting it" (p. 1352). This definition is useful in that it recognizes the importance of the individual's perception of the situation as the cause of stress. The notion of rewards and costs also addresses the idea that the importance of the situation to the individual has a bearing on the amount of stress perceived. On the other hand, specifying demand as the

only cause of stress is even more limiting than Schuler's (1980) conceptualization of stress.

In terms of the present research, Sharit and Salvendy (1982) offered a useful definition of stress as "a multidimensional phenomenon that is reflected in the individual's physiological and psychological responses to a particular situation" (p. 130). This definition is useful because it conceptualizes stress as having several facets or dimensions, because it recognizes both the psychological and physiological outcomes for the individual, and because it recognizes the influence of the environment.

One aspect missing from this definition, however, is the mediating influence of individual perception. Many researchers have emphasized the influence of perception in the causation of stress (e.g., Coburn, 1975; McGrath, 1976; Wells, 1982). For the purposes of this study, which will use a self-report measure of stress, it will be particularly appropriate to view stress as perceived stress, since it will be the individual's perceptions that the self-report measure will ascertain.

In this study, therefore, stress will be considered perceived stress, and will be defined conceptually as: the perception of the multidimensional situational and environmental influences that impinge on the individual as being unpleasant or disagreeable, and that interact with this perception to produce psychological and physiological outcomes. This definition recognizes the importance of perception and its interaction with the environment in the causation of stress. Also recognized is the multidimensional nature of stress and the potential for psychological and physiological outcomes for the individual. Rejected is Schuler's (1980) view of stress as consisting of only constraint, opportunity, and demand as defined by the situation. Also rejected is McGrath's (1976) view of stress as a demand that may exceed the individual's ability. Adopted is a more general conceptualization of stress as a perception of a disagreeable or unpleasant environment or situation. McGrath's (1976) inclusion of perception, however, is embraced as an essential element in the causation of stress. Also included in the present definition of stress are the Sharit and Salvendy (1982) views of stress as multidimensional and as leading to psychological and physiological responses.

Much of the work on stress in organizational environments has concentrated on elements of role stress. Elements of role stress most studied have been role conflict and ambiguity (House & Rizzo, 1972; Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964; Rizzo, House, & Lirtzman, 1970), and role overload and underload (Beehr, Walsh, & Taber, 1976; Frankenhaeuser & Gardell, 1976; French, 1974; Sales, 1970).

However, the separation of the stressor from the stress is not always clear. Tracy and Johnson (1981) concluded that a widely used role conflict scale (Rizzo et al., 1970) is really a role stress scale. Kasl (1978) has pointed out a methodological trap that has caught some researchers in studies of role stress. Often in questionnaire research, the stressful stimuli, such as role conflict and ambiguity, as operationalized, are so similar to the operationalization of individual perceived stress or strain that the independent variable of conflict or ambiguity may be virtually the same construct as the dependent variable of, say, tension or fatigue.

With these cautions in mind, it worth noting that many researchers have found full or partial support for a negative relationship between role stress variables and job satisfaction (Hamner & Tosi, 1974; House & Rizzo, 1972; Rizzo et al., 1970; Schuler, 1975, 1977; Tosi, 1971). Role overload was found to correlate with job-related tension

(Sales, 1969) and subjective workload, the individual's own perception of the level of work (Sales, 1970). Even so, those experiencing role overload were found to have greater task enjoyment than those experiencing role underload, which is similar to boredom. Boredom or underload, on the one hand, and overload, on the other, are generally considered to reside at opposite ends of a continuum (Lazarus, 1971), yet both have been associated with high stress (Frankenhaeuser & Gardell, 1976; French, 1974).

Though the concept of role has value in the study of organizational stress, it is necessarily limiting, since sources of stress other than role are ignored. Kahn et al. (1964), though concerned with role stress, theorized that organizational factors other than role prescription may influence perceived stress in the individual.

The twin concepts of role overload and role underload connote a mismatch between an individual and the role or job that individual is expected to fulfill. Due to differences in abilities or aptitudes, a job may be experienced as overload for some, yet as a good match or underload for others. In other words, the environment or situation does not entirely define underload or overload. They are defined jointly by the individual, the environment, and the interaction between the individual and the environment (Beehr & Newman, 1978; Lazarus, 1971; McGrath, 1976).

Regardless of orientation, researchers have indicated the importance of the individual's own view of the environment as a determining aspect of stress. Some (McGrath, 1976; Wells, 1982) have referred to this aspect as the perception of stress, while others (French et al., 1982; Kasl, 1978; Sales, 1970) have called it subjective stress. Most researchers have found subjective measures to be better predictors of stress than objective measures of the job (French & Caplan, 1972; French et al., 1982; House, McMichael, Wells, Kaplan, & Landerman, 1979). What this suggests is that it is not the environment itself that the individual finds as stressful, but rather the environment as mediated by the individual's perception that is stressful.

McGrath (1976) stated that "it is not the actual ('objective') danger, or potential hazard, that determines the experience of stress. Rather, it is the person's appraisal or interpretation of the environmental state" (p. 1390). This statement has been echoed by other researchers. Shirom (1982) conceptualized stress as the perception of environmental demand as being beyond the individual's ability or resources. Wells (1982) stated that the effect of the environment is dependent on how it is "experienced and appraised" by the individual (p. 80).

Psychological and physiological factors have been found to interact to cause health problems, providing support for the notion of perceived stress (Beehr & Newman, 1978). In addition, the interaction between the individual and the environment can also contribute to health problems (Jenkins, 1976). Coburn (1975) determined in a study of Canadian working men that perceived job-worker incongruence predicted poor physical and mental health. Sheposh, Kunkel, and Sprague (1982) found that environmental and personal characteristics influenced the degree and type of perceived stress. This psychological stress, in turn, had an effect on physiological stress, as measured by psychosomatic symptoms.

Cherry (1978), in a survey of young American men, found that individual factors (susceptibility to anxiety) and job factors contributed approximately equally to the degree of stress reported. She also found that reported stress was related to amount of pay earned, even within job category. In a survey of blue collar workers, Wells (1982)

found that objective job conditions were modestly related to perceived stress. Such individual characteristics as age and education did not moderate this relationship.

Little has been written until recent years on the effect of incentives or performance on perceived stress. Marriott (1971) briefly discusses the effects of repetitive work on interest and monotony. Several researchers (e.g., French & Caplan, 1972; Kahn et al., 1964; McGrath, 1976; Schuler, 1980) have concluded that persons with greater ability or experience encounter less stress when performing similar or identical tasks. In addition to individual differences, situational differences such as job characteristics have been linked to stress. Kornhauser (1965) and Frankenhaeuser and Gardell (1976) concluded that stress is positively related to task difficulty and controlled work pace. Buck (1972) concluded that a lack of opportunity to use valued skills and abilities in the work environment could act as a stressor, while Parasuraman and Alutto (1981) concluded similarly that work "routinization" is positively related to role frustration.

McGrath (1976) concluded that performance has a positive linear relationship with arousal, which was defined as pulse rate, breathing rate, and behavioral activity. Scott (1966), in his review of activation theory, disputed the existence of this linear relationship over an infinite range, concluding that performance will eventually decline when activation or arousal exceeds an optimum level. Some researchers have adopted the moderate position that the stress-performance relationship can be a positive linear relationship or an inverted-U relationship, depending on the type of stressor and the type of performance measure (Beehr and Newman, 1978).

Friend (1982) found that performance has a strong negative relationship with workload and time pressure, two elements of stress. However, stressors such as time pressure need not necessarily relate negatively to performance. In a study of scientists and engineers, Andrews and Farris (1972) found that time pressure yielded several positive results, including increased innovation, improved performance, and greater value to the organization. One reasonable explanation for these conflicting results is that the individual's perception of the stressor determines its effects, as discussed in the definition section above. Friend (1982) explained his results as being due to the problem-solving nature of the task. Alternatively, it could be that the results were due to the fact that the problem-solving task was a test.

Boredom, as an aspect of stress, has received a moderate degree of attention. Selye (1976) theorized that not only overstimulation, but also understimulation, could be stressful. Similarly, role underload (French, 1974; Sales, 1970) has been considered a stressful condition. Sales (1970) found that subjects in a role underload condition experienced less job satisfaction than subjects in an overload condition.

Boredom, however, is not universally conceded to be an indicator of stress. In a review of research on boredom and monotony, Thackray (1981) concluded that these conditions are not in themselves stressful. He concluded that boredom and monotony occur in combination with other aversive stimuli, such as the requirement for constant attention or alertness, as in machine-paced work, and that it is the interaction between these two variables that causes physiological stress. In support of Thackray's (1981) conclusion, Sales (1970) found a significantly higher heart rate for subjects in an overload condition than in an underload condition. Harris and Berger (1983) found that psychological stress resulted from overload but not from underload.

It must be recalled, however, that according to the theoretical framework adopted in this study, stress is what is perceived as stressful. Weiman (1977), in a study of more than 1,500 officers in a large financial institution, compared responses to an organizational stress questionnaire with results of physical examinations. The curvilinear relationship described by Selye (1976) was in evidence, with the greatest risk of disease occurring in persons reporting extremely high and extremely low levels of organizational stress. Not only does this conform to Selye's hypothesized curvilinear relationship, it also tends to support the relationship between perceived stress and physiological symptoms of stress.

More than 50 years ago, studies conducted in Great Britain (Wyatt & Fraser, 1929) concluded that boredom is related to decreased output in repetitive industrial jobs. More recently these findings have been questioned. Smith (1953) found no necessary relationship between boredom and output in a piece-rate clothing mill. Her findings must be viewed with caution, however, because of the influence of the piece rate, which caused workers to set daily quotas for themselves. Smith (1955) found in a later study that those most susceptible to boredom and monotony tend to be young persons with restless energy.

The relationship of pay to job stress has received little research emphasis. Katzell and Yankelovich (1975) found that amount of pay is related to feelings of tension. However, this relationship is likely to be confounded by the fact that higher paying jobs entail greater responsibility. Men in high-level jobs have been found to report greater nervous strain than men performing manual work (Cherry, 1978).

In laboratory experiments, subjects who were paid incentives to perform a manual response task had significantly higher pulse rates than subjects in a control condition (Fowles et al., 1982). In similar experiments, however, Tranel et al. (1982) failed to replicate this finding. In these latter experiments, two levels of incentive were employed in addition to the control condition. Although no effect was found for magnitude of incentive on performance, it was found that incentive level had a significant effect on heart rate.

Though these results have important implications for stress in the workplace, several qualifications must be made regarding their generalizability. First, the incentive award amounts were very small: a mean of $3.21 for the low incentive rate group and a mean of $8.29 for the high incentive rate group. Second, the subjects were aware that they were involved in a laboratory experiment, which introduced artificiality into the incentive situation. Third, the incentives were earned within a single hour, so the applicability to a daily work situation was severely limited. Fourth, the stress effect measured was physiological, not a self-report measure of perceived stress as will be used in this study. All these points regarding the nature of the Fowles et al. (1982) and Tranel et al. (1982) findings signal caution in their application to the present study. Nevertheless, the results provide the basis for further research into the stress effects of incentives in a more comprehensive and realistic setting.

The British studies on boredom and monotony mentioned above (Wyatt & Fraser, 1929) suggested piece-rate incentives in repetitive work lead to fewer feelings of boredom than does hourly pay. Though Smith (1953) was critical of these earlier findings, her results can also be interpreted as supporting them. The Turner and Miclette (1962) study of assemblers working under an incentive system found fewer than

20 percent of the workers describing the job as monotonous and boring, in spite of the tedious nature of the work and the repetitiveness of extremely short work cycle times.

Hypotheses

The above literature review raises two general research questions. First, what are the relationships of incentive pay and performance to job satisfaction? And second, what are the relationships of incentive pay and performance to perceived stress? Hypotheses relating to these research questions are outlined below:

The opportunity to earn incentives will relate positively to job satisfaction. Most researchers have found support for the hypothesized relationship (e.g., Greene, 1973; Katzell & Yankelovich, 1975; Wimperis & Farr, 1979). The evidence has not been unequivocal, however. In a study by Farr (1976), incentive pay did not lead to increased satisfaction, whereas regular pay did relate to increased satisfaction. In the present study, however, the incentive pay will be awarded in addition to regular pay, conforming to the predominant business practice. Under these conditions, incentive pay is hypothesized to relate to greater job satisfaction.

The level of incentive[1] will relate positively to job satisfaction. Amount of pay has been positively related to job satisfaction and pay satisfaction (Dyer & Theriault, 1976; Katz & Van Maanen, 1977; Katzell & Yankelovich, 1975). In these studies, however, pay was confounded with job level. In a study of merit pay and satisfaction, Greene (1973) found that merit pay raises of 3 percent to 15 percent were positively related to job satisfaction, and that the relationship was greater for high performers than for low performers. This finding provides some support for the hypothesis that level of incentive, or sharing rate, will be positively related to job satisfaction.

Performance will relate positively to job satisfaction. There is a large body of evidence to indicate that performance is related to job satisfaction (Abdel-Halim & Rowland, 1976; Baird, 1976; Bhagat, 1982; Carlson, 1969; Lawler & Porter, 1967; Porter & Lawler, 1968; Slocum, 1970, 1971; White et al., 1977). Two studies, however, found no necessary relationship between performance and satisfaction (Cherrington et al., 1971; Greene, 1973). In each of these studies, performance was related to satisfaction when pay was tied to performance. These studies demonstrate that performance and satisfaction are related in settings where pay is contingent on performance. Ability has been found to moderate the performance-satisfaction relationship (Carlson, 1969). For this reason, performance scores in this study will be controlled for task ability in determining their relationship to job satisfaction.

The opportunity to earn incentives will interact with ability to increase the positive relationship with job satisfaction. Several researchers have proposed that motivation and ability interact to increase performance (Fleishman, 1958; Galbraith & Cummings, 1967; Ilgen, Pritchard, Bigby, & Nebeker, 1982; Vroom, 1964). Others have emphasized the motivating potential of incentives (Fein, 1982; Katzell & Yankelovich, 1975; Locke et al., 1980). It would follow, therefore, that incentives and ability should interact to increase performance. If the relationship between performance and satisfaction is as

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[1]As defined here, incentive level is the percent of labor costs saved by an employee's performance above a standard that is shared with the employee; that level is also known as the "sharing rate."

hypothesized above, then it would further follow that incentives and ability will interact to increase job satisfaction.

The level of incentive (sharing rate) will interact with ability to increase the positive relationship with job satisfaction. As in the above hypothesis, incentives are considered to motivate such that incentives and ability should interact to increase performance. Further, given the relationship between performance and satisfaction predicted above, incentives and ability should interact to increase the positive relationship with job satisfaction. Finally, given the rationale for the relationship between incentive level, or sharing rate, and job satisfaction hypothesized above, it is predicted that incentive level and ability will interact to increase the positive relationship with job satisfaction.

The opportunity to earn incentives will relate positively to intrinsic job satisfaction. As several investigators have concluded (Hamner & Foster, 1975; Scott, 1975; Staw, 1976; Staw et al., 1980), in a setting in which payment for work is expected, extrinsic rewards are related to greater intrinsic motivation and intrinsic job satisfaction. Since incentive pay is generally considered an extrinsic reward (Dyer & Parker, 1975), incentive pay is expected to relate to greater intrinsic job satisfaction.

The level of incentive (sharing rate) will relate positively to intrinsic job satisfaction. As in the previous hypothesis, incentive is expected to relate to intrinsic job satisfaction. As predicted above, incentive level should be related to greater job satisfaction. The combined reasoning of these hypotheses provides the basis for the relationship between incentive level, or sharing rate, and intrinsic job satisfaction.

The opportunity to earn incentives will relate positively to perceived stress. Fowles et al. (1982) found that subjects awarded incentives had a higher pulse rate than those in a control condition. It is hypothesized that this finding will generalize from the measure of pulse rate to a self-report measure of perceived stress.

The level of incentive (sharing rate) will relate positively to greater perceived stress. In an experiment similar to the Fowles et al. (1982) study, Tranel et al. (1982) found that subjects in a high incentive rate condition had higher pulse rates than subjects in a low incentive condition. As in the hypothesis above, it is expected that perceived stress will be higher in the high incentive rate groups.

Performance will relate positively to perceived stress. McGrath (1976) held that stress and performance have a positive linear relationship. Others (Beehr & Newman, 1978; Scott, 1966) have subscribed to an inverted-U relationship, with performance first increasing to a maximum, then declining, as stress increases. Schuler (1980) hypothesized that performance maintained this inverted-U relationship with "opportunity stress" and "constraint stress." In conflicting findings, however, Smith (1957) found a negative relationship between role ambiguity and performance. Schuler (1980) maintained that "demand stress" and performance have a negative relationship. In the present study, however, these negative relationships should not be operative, since the study is designed to minimize role ambiguity and perceptions of situational demand. Furthermore, since task effort by participants will be self-determined, it is anticipated that effort will not reach the declining portion of the inverted-U stress-performance relationship. The relationship between performance and stress, therefore, should be a positive linear relationship in the performance ranges anticipated in this study.

The opportunity to earn incentives will relate negatively to boredom. Findings by Wyatt and Fraser (1929), Smith (1953), and Turner and Miclette (1962) converge to indicate that boredom is negatively related to the award of incentive pay. Several investigators (e.g., Buck, 1972; French, 1974; Parasuraman & Alutto, 1981; Sales, 1970; Selye, 1976) have held that boredom or understimulation is a stressful condition.

The level of incentive (sharing rate) will relate negatively to boredom. As in the previous hypotheses, level of incentive, or sharing rate, is expected to have the same relationship with boredom as incentive versus no incentive.

Individual performance will relate negatively to boredom. Findings by Wyatt and Fraser (1929) and Drory (1982) indicate that decreased performance is associated with boredom, except under conditions of incentive pay (Smith, 1953; Turner & Miclette, 1962; Wyatt & Fraser, 1929).

METHOD

Overview of the Organizational Simulation

College and high school students were hired for part-time summer work to perform a routine clerical task. The employees worked 5 days, 4 hours per day in a simulated work environment transferring answers from previously completed Navy questionnaire booklets onto machine-readable forms. Employees were informed that the purpose of the work was to develop a data base for future use by the U.S. Navy.

Applicants were randomly assigned to one of seven work shifts, or groups, with each group having a maximum of 20 employees. All employees earned a base salary of $4.40 per hour. Employees in five of the seven groups had the opportunity to earn incentive pay for performing above a predetermined performance standard. The level, or sharing rate, of this pay incentive was different in each of the five incentive groups. Employees were told (truthfully) that other groups doing the same work were being paid by a different method. No further details were given regarding payment in other groups, nor did the employees express interest in learning of other pay methods or rates.

On the first, third, and fifth days, employees were requested to respond to self-administered questionnaires, each of which required about 45 minutes. At the end of the last day, employees were thanked for their work and their participation in answering the questionnaires, and were given a brief synopsis of the purpose of the research.

Employees

Job announcements and advertisements attracted 224 applicants from the San Diego area. From this pool of applicants, 140 employees were selected. Due to attrition between the date of assignment and the date that work started, the final sample consisted of 129 employees.

Design

Employees were randomly assigned to one of seven groups. Two experimental designs were incorporated: a 1 X 2 design to determine if there was an effect for the quantitative performance standard, and a 1 X 6 design to test the effects of incentive (versus no incentive) and level of incentives. As depicted in Figure 1, Group 7 had no

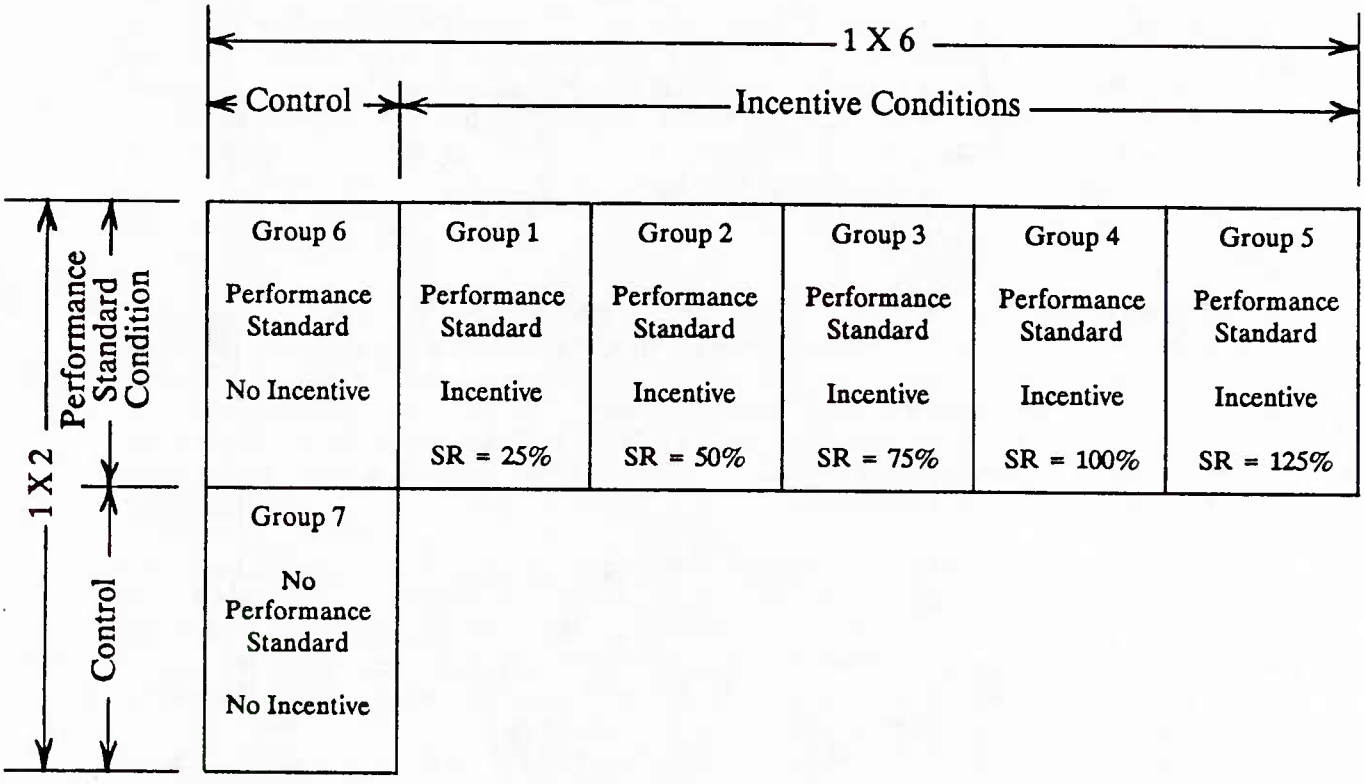

Figure 1. Experimental design.

incentive and no performance standard, serving as a control condition for Group 6. In turn, Group 6 had a performance standard but did not work for incentive, thus serving as a control for Groups 1 through 5.

A performance standard of 5.75 questionnaires per hour was established for Groups 1 through 6. This standard, which should be considered relatively difficult, had been previously determined using conventional industrial engineering stopwatch and pace rating methods (Barnes, 1980). Employees in Groups 1 through 5 who exceeded the performance standard earned incentive pay at various levels or sharing rates. All employees received feedback on their performance for all preceding days' work.

Task

The work performed in this study was a clerical transfer task, in which the employees were required to code questionnaire responses onto mark-sense forms. Each of the questionnaire booklets, obtained from an earlier study, contained 193 responses that the employees transferred onto the mark-sense forms, along with a four-digit employee number, for a total of 197 circles or "bubbles." Each employee was given an ample supply of questionnaire booklets, mark-sense forms, and #2 pencils so the work could be performed without interruption.

The completed mark-sense forms were collected at the end of each workday and machine scored. The coded answers were compared against a master file containing the correct responses for each questionnaire booklet. The tallied and scored mark-sense forms provided the basis for the Performance Efficiency Report, a feedback report given to each employee on Days 2 through 5 at the beginning of the day. The report was designed as an analog to reports frequently used in organizational feedback and reward systems (Nebeker & Neuberger, 1985; Shumate, Dockstader, & Nebeker, 1978). This report presented daily and weekly totals of questionnaires completed, questionnaires completed per hour, error rate, performance efficiency, hours worked, base pay, incentive pay, and total pay earned. An example and more complete description of the reports given to incentive groups 1 through 5 are presented in Appendix A.

Measures

Ability

Two measures of ability were obtained. First, the clerical aptitude (CA-2) portion of the *Short Employment Test* (SET) was administered during the hiring process (Bennett & Gelink, 1978). Then, on the first day of work, immediately following training, employees took a maximum-performance work-sample test.

The SET scores and work-sample scores were tested for randomness of assignment across work groups. One-way analyses of variance revealed that SET scores were randomly distributed, but that work sample scores were not randomly distributed, F (6, 122) = 5.97, $p < .001$. On examination of the distribution of work sample means across groups, it was noticed that high and low scores were associated with different supervisors at different work locations. To test for this effect, a t-test was performed, with supervisor/location as the predictor of work-sample score. The results were highly significant, t (127) = 3.97, $p < .001$.

It appears more reasonable to use SET as the measure of Ability than to use work-sample scores covaried by supervisor/location, because it is not certain that supervisor/location is the cause of the nonrandom distribution. An investigation revealed no rational explanation for a possible supervisor or location effect. The training session during which the work sample was administered was carefully scripted. The sizes, shapes, and layouts of the workrooms were not materially different. It may be that the actual explanation for the nonrandom distribution is hidden in the data, with the supervisor/location effect occurring as a mere artifact.

Thus, in spite of higher zero order correlations between work sample and performance, $r = .41$, $p < .001$, than between SET and performance, $r = .23$, $p < .01$, SET is used to measure Ability because of its random distribution across work groups.

Performance Standard

As explained in the Design section, the Performance Standard is 5.75 questionnaires coded per hour. This standard was determined prior to the study using industrial engineering methods (Barnes, 1980). Group 6 is designated as the Performance Standard Group, which worked against the Performance Standard, but without incentives. The No Standard Group is Group 7.

Performance

As discussed in the Task section, Performance is a measure of the number of questionnaires coded per hour onto mark-sense forms. Although Performance is computed using only the time the employees actually worked on the task, the computed rate is applied to the entire workday. Performance quality is measured by computing error rate as the percentage of total coded responses that are incorrectly coded. Both Performance and error rate were machine scored at the end of each workday. For this study, mean employee performance on Days 3 and 4 was used to measure Performance.

Performance Efficiency

Performance Efficiency is computed by dividing the day's Performance by the Performance Standard of 5.75 questionnaires per hour.

Sharing Rate

Sharing Rate is the percentage of hourly labor cost savings resulting from Performance Efficiency exceeding the Performance Standard, which is shared with the employees (Fein, 1982). In this study, the Sharing Rate ranges from 25 percent to 125 percent, as depicted in Figure 1. The Sharing Rate is applied to performance above the Performance Standard. The resulting figure is multiplied by the $4.40 hourly base salary to compute incentive pay earned. A detailed explanation of incentive system computation is presented in Appendix B.

Incentive Opportunity

The Incentive Opportunity measure collapses across Groups 1 through 5 to form the Incentive condition, which is compared with the No Incentive condition. This latter condition consists of Groups 6 and 7 for all analyses except those dealing with Job Satisfaction. (As discussed below in the Analysis section, there was no difference

between the No Standard and Performance Standard Groups using any criterion measure except overall Job Satisfaction.)

Incentive Level

For the Incentive Level measure, the Sharing Rates of Groups 1 through 5 are used. Groups 6 and 7 are excluded from Incentive Level analyses.

Job Satisfaction

The Job Satisfaction scale used in this study contains 13 items from a scale developed by Szilagyi and Wallace (1980), and three items adapted from the Survey of Organizations (Taylor & Bowers, 1972). The Szilagyi and Wallace scale contains the five-factor structure most commonly associated with job satisfaction: the work itself, pay, promotion, supervision, and co-workers. Items pertaining to promotion satisfaction were deleted since they are not applicable to this study. The items adapted from the Survey of Organizations represent overall job satisfaction. The Job Satisfaction scale used in this study and statistics for the scale items are displayed in Appendix C.

Intrinsic Job Satisfaction

To measure Intrinsic Job Satisfaction, modified intrinsic job motivation and perceived intrinsic job characteristics scales developed by Warr, Cook, and Wall (1979) were used. The scales and individual item statistics are shown in Appendix C.

Perceived Stress

In order to construct a Perceived Stress scale applicable to the present study, the job was analyzed to determine which aspects of the job were potentially stressful. Based on this analysis, items were drawn from several scales previously developed to measure organizational stress (French et al., 1982; LaRocco et al., 1974). Constructs that these items purport to measure are role ambiguity, role conflict, job pressure, quantitative workload, job characteristics, boredom, and workload dissatisfaction. In addition, items were constructed to measure job environment. The result is a 22-item composite scale, which appears, along with individual item statistics, in Appendix C.

Procedure

Recruitment and Selection

Job applicants were recruited through job announcements posted at San Diego area colleges and high schools, and advertisements in a university student newspaper. Applications were processed by a university foundation that coordinates student employment.

Applicants were administered the clerical aptitude portion of the SET. After completing the testing procedures, applicants were randomly assigned to one of the seven groups and told they had been tentatively hired. This tentative hiring was explained to mean that any applicant who reported to the assigned workplace at the appointed time would receive a minimum of 4 hours' pay, regardless of the final hiring decision.

Prior experience with the SET (Ilgen et al., 1981; Ilgen el al., 1982) indicated that persons scoring below 23 could not be expected to perform at a minimally acceptable level, so this score was chosen as a preliminary hiring criterion. As employees arrived at work, attendance was ascertained from rosters prepared for each group. Applicants who had failed to meet the SET criterion score of 23 were dismissed.

Employees were asked to choose a place to sit. The workrooms contained tables approximately 2.5 ft. x 6 ft (0.8 m x 1.8 m) with two chairs at each table. Each seating place, referred to as a work station, was numbered with a three-digit code, the employee number referred to in the Task section above. Employees were told they could sit at any work station they wished, but that their choice of work station and employee number would be retained for the remainder of the week.

Training

Because the simulation was conducted simultaneously for two groups at a time in separate locations, there were two employee supervisors. Training instructions and work rules were presented by each supervisor from a detailed script to ensure standardization of procedures. Employees were first informed of the purpose of the work, which was explained as the coding of questionnaire responses to build a data base for future Navy research. Employees were also told that the Navy would be granted time during the week to administer attitude instruments that would ask them questions about the work, in connection with research on attitudes in a variety of jobs.

Training consisted of explaining to employees the procedures to be followed in the coding task. Transparencies of the training materials were used to facilitate training. Employees followed along by referring to sample questionnaires and mark-sense forms at their work stations. Emphasis was placed on speed, accuracy, and neatness. After questions were answered and employees indicated that they understood the task, they were given 30 minutes practice time to gain task proficiency.

Employees were then given a 10-minute test consisting of a sample of the work. The work sample was intended to be used as an ability measure. (It was not used because work-sample scores were not randomly distributed across groups.) In order to obtain maximum performance, employees were told that their performance on the timed work sample would determine the final hiring decision. (Recall that each applicant had been informed that hiring was tentative.) Once again, speed, accuracy, and neatness were emphasized. In point of fact, all employees who completed the training and the work sample were retained.

Following the work sample, the Performance Standard was explained to employees in all groups except Group 7, the No Standard Group. In addition, the incentive plan was explained to employees in Groups 1 through 5. Displayed prominently each workday were amounts of incentive pay and total pay per hour that could be earned by performing at incremental levels above the Performance Standard, and a formula for computing incentive pay earned. Employees in Groups 1 through 5 earned incentive pay in addition to base pay for all daily performance exceeding a Performance Efficiency of 100 percent.

In addition to base pay of $4.40 per hour, employees were paid for all performance exceeding the Performance Standard of 5.75 questionnaires per hour. This performance above the standard was reimbursed at the sharing rate for that employee's group. For

instance, an employee who on a given day performed at a level 30 percent above the Performance Standard would save the employer .30 hours for each hour worked that day. These savings would be multiplied by the employee's sharing rate. Thus, if the employee was in the 50 percent sharing rate group, the employee's share of the savings would be .30 x .50 = .15, or 15 percent of the value of a saved hour. Since the hourly value, or pay rate, in this case is $4.40, the employee would receive $4.40 x .15 = $.66 additional pay per hour for that day's performance. For a more detailed explanation of incentive pay computation, refer to Appendix B. Training instructions and work rules are shown in Appendix D, which contains the supervisor's outline for the first day and approximate times of the experimental protocol throughout the week.

Work Sessions

Following training on Day 1, and at the beginning of work on Days 3 and 5, employees were administered research instruments, each requiring approximately 45 minutes. In addition to the measures used in this study, several measures in these questionnaires were included for concurrently conducted studies.

When the research instruments were to be administered, the supervisor introduced a Navy researcher and left the room. The researcher explained that, since the Navy had contracted for the work, they had been granted time to ask the employees about work attitudes. It was explained that the information gathered was part of a larger study on work attitudes in a wide variety of jobs and working conditions. It was emphasized that participation in this research was voluntary. When these administration sessions were complete, the researcher departed and the supervisor returned.

At the beginning of each workday after Day 1, employees found at their work stations Performance Efficiency Reports for all previous days' work. On Day 2, 5 to 10 minutes were taken to explain these reports to the employees. They were given the opportunity to ask questions and appeared to understand the reports. An explanation and a sample of these feedback reports are found in Appendix A.

Each workday, employees were given an initial supply of questionnaires, mark-sense forms, and sharpened #2 pencils. As they completed the work, they were resupplied with questionnaires and mark-sense forms so that they could work without interruption. Supervisors collected the completed mark-sense forms and questionnaires, and monitored employees' work. Employees whose work failed to meet the quality standards discussed during training were cautioned regarding their work quality. Supervisors closely monitored the work of employees whose error rate exceeded the recommended 2 percent rate, and pointed out possible reasons for their high error rates.

Employees were allowed to take breaks as often as they wished. Vending machines located close to each workroom provided refreshments. Rest rooms and water fountains were also nearby. Employees were requested not to abuse the privilege of taking breaks, and with few exceptions this work rule was followed. Quiet talking among co-workers was allowed, as was the use of radios with headsets. No food or drink was allowed at the work stations.

At 5 minutes prior to the end of each work session, employees were informed of that fact and requested to finish the questionnaire they were coding, at which time they were allowed to leave. Employees were not allowed to work more than 3 minutes past

the end of the work session. Incompletely coded mark-sense forms were not counted in the production total. A wall clock was visible in each room.

Fifteen minutes before the end of the last day, employees were debriefed on the research being conducted. They were thanked by the supervisors and the experimenters for their work and their cooperation in responding to the research instruments. Before being dismissed, they were given an opportunity to ask questions and sign up to receive a brief summary of the research results, then dismissed.

Work Environment

The essential element of a work simulation should be the creation of an environment that represents a real work setting. The present study was planned and conducted from the outset with realism a primary consideration.

From the time of their initial contact with the study, participants were exposed to persuasive influences that conveyed the impression of hiring to perform bona fide work. The jobs were advertised as part-time summer work. Applicants were processed in accordance with standard San Diego State University Foundation hiring procedures. At work, employees were given work rules and instructions, as would be done in any job. They were treated as employees, not experimental subjects, by the work supervisors and by the researchers administering the research instruments. The rooms in which the study was conducted were made to appear as work-like as possible. And, of course, the work was ostensibly plausible, useful, and meaningful. Finally, the employees were paid at current job market pay rates for an entire week of part-time work.

All these factors combined to establish the impression among employees that they were performing real work and not participating in an experiment. Never in any of the groups did employees seriously question the veracity of the work, nor did they question the impression given that they were bona fide employees.

Analysis

Factor Analysis

A varimax orthogonal rotation factor analysis was performed on the Job Satisfaction and Perceived Stress scales (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975). The Job Satisfaction scale yielded four factors, representing Satisfaction with the Job Itself, Pay Satisfaction, Supervisor Satisfaction, and Co-Worker Satisfaction, as expected (Belcher & Atchison, 1976; Schwab & Cummings, 1970).

With the Perceived Stress scale, the factor analysis yielded six factors. Although scale items did not load particularly cleanly on a single factor, the factors did represent definable constructs used in previous stress research (French et al., 1982; Sharit & Salvendy, 1982). The factors derived were Boredom, Job Pressure, Job Content Stress, Workload Stress, Workload Dissatisfaction, and Environmental Stress. Results of the varimax rotated factor matrices from these factor analyses (Nie et al., 1975) are displayed in Appendix E.

For both the Job Satisfaction scale and the Perceived Stress scale, the items loading most strongly on the respective factors were combined to form subscales representing

different aspects of the larger constructs. Thus, Job Satisfaction and Perceived Stress in this study are each conceived as clusters of subscales of the general construct.

Internal reliabilities for the scale measures and factors used in the study were computed by the coefficient alpha method. Reliabilities are shown in parentheses along the diagonal of the scale and factor correlation matrix in Table C-5 of Appendix C.

Analysis Method

Hypotheses of the relationships of Incentive Opportunity, Incentive Level, and Performance to the global constructs of Job Satisfaction and Perceived Stress were tested via one-way multivariate analyses of variance (MANOVAs) and covariance (MANCOVAs) (Barcikowski, 1980; Hull & Nie, 1981). Significance was tested using the Wilks' lambda approximate F statistic. The variables representing Job Satisfaction will be the four subscales yielded by the factor analysis, along with the scales of Intrinsic Job Satisfaction and Perceived Intrinsic Job Characteristics. The variables representing Perceived Stress will be the six subscales yielded by the factor analysis. The effect of the Incentive-by-Ability interactions will be tested via two-way MANOVAs.

One-way MANOVAs testing hypotheses with Performance as a predictor will divide that variable into quintiles, and will be covaried by SET as an ability measure. The use of SET as a covariate will allow raw SET scores to be used. However, two-way MANOVAs testing the interaction of Ability and Incentives will require discrete values, so SET in this case will be divided into quintiles.

The hypothesized relationship of Incentive Opportunity to Intrinsic Job Satisfaction will be tested via t-tests using the Intrinsic Job Satisfaction scale. The hypothesized relationship of Incentive Level to Intrinsic Job Satisfaction will be tested by a one-way analysis of variance (ANOVA). The hypothesized relationship of Incentive Opportunity to Boredom will be tested via a t-test using the Boredom subscale derived from the factor analysis. The hypothesized relationship of Incentive Level to Boredom will be tested via a one-way ANOVA. The hypothesized relationship of Performance to Boredom will be tested via a one-way analysis of covariance (ANCOVA).

RESULTS

Performance Standard

Though no hypotheses were stated for the relationships of Performance Standard to Job Satisfaction and Perceived Stress, a test for such relationships is indicated by the experimental design displayed in Figure 1. Should no relationship with Performance Standard be found, Groups 6 and 7 can be collapsed to form a single control group when testing for Incentive Opportunity.

One-way MANOVAs (Barcikowski, 1980; Hull & Nie, 1981) were, therefore, performed on the clusters of scales and subscales representing Job Satisfaction and Perceived Stress. With respect to Job Satisfaction, a multivariate difference was found between the No Standard and the Performance Standard Groups, F (6, 26) = 3.00, $p < .05$. This multivariate difference existed although there was only one univariate difference between No Standard and Performance Standard on the Job Satisfaction subscales. This difference was in Co-Worker Satisfaction, t (31) = 3.70, $p = .001$. The results of this analysis are displayed in Table 1.

Table 1

Summary of Results of One-Way MANOVA to Test for Effect of Performance Standard on Job Satisfaction

Scale/Subscale	$\overline{X}$	SD	F/t[1]	df	p
Job Satisfaction	3.25	0.44	3.00	6, 26	.023
Intrinsic Job Satisfaction	3.66	0.50	-0.11	31	.912
Perceived Intrinsic Job Characteristics	2.93	0.97	0.30	31	.767
Satisfaction with the Job Itself	2.59	0.75	-1.40	31	.172
Pay Satisfaction	3.42	0.70	-0.91	31	.372
Supervisor Satisfaction	3.93	0.48	-0.58	31	.568
Co-Worker Satisfaction	3.69	0.52	-3.70	31	.001

[1]Job Satisfaction: Wilks' lambda approximate F statistic; subscales: t statistic.

	Group Means	
Subscale	No Standard	Performance Std
Intrinsic Job Satisfaction	3.67	3.65
Perceived Intrinsic Job Characteristics	2.88	2.98
Satisfaction with the Job Itself	2.77	2.41
Pay Satisfaction	3.53	3.31
Supervisor Satisfaction	3.99	3.88
Co-Worker Satisfaction	3.98	3.41

Due to this overall Job Satisfaction difference between the No Standard and Performance Standard Groups, the hypotheses testing the relationship between Incentive Opportunity and Job Satisfaction will use only the Performance Standard Group to represent the No Incentive condition. A one-way analysis of variance (ANOVA) found no difference in Intrinsic Job Satisfaction between the No Standard and Performance Standard Groups, so the hypothesis testing the relationship between Incentive Opportunity and Intrinsic Job Satisfaction will combine the No Standard and Performance Standard Groups to represent the No Incentive condition.

The one-way MANOVA performed on the Perceived Stress subscales found no difference between the No Standard and Performance Standard groups, although the results approached significance, F (6, 25) = 2.36, NS. Due to this lack of difference, the hypothesis testing the relationship between Incentive Opportunity and Perceived Stress will combine the Performance Standard and No Standard groups to represent the No Incentive condition. Similarly, a one-way ANOVA found no difference in Boredom between these two groups, so they will be combined to test the hypothesized relationship between Incentive Opportunity and Boredom.

Job Satisfaction

In order to test the effect of Incentive Opportunity on Job Satisfaction, the Incentive groups, Groups 1 through 5, were collapsed across levels and compared with Group 6, the No Incentive condition. As predicted, a one-way MANOVA revealed that Incentive Opportunity was significantly related to Job Satisfaction, F (6, 93) = 2.30, $p < .05$. T-tests revealed that Incentive Opportunity was also related to Satisfaction with the Job Itself, t (98) = 2.17, $p < .05$, and Pay Satisfaction, t (98) = 2.37, $p < .05$. These analyses are summarized in Table 2.

A one-way MANOVA was performed to test the relationship of Incentive Level to Job Satisfaction. As Table 3 indicates, there was a significant relationship between Incentive Level and Job Satisfaction, F (24, 256) = 1.92, $p < .01$, but it is questionable whether the relationship is positive. One-way ANOVAs testing the relationships between Incentive Level and the subscales revealed that Incentive Level was related to Supervisor Satisfaction, F (4, 78) = 3.45, $p < .05$, though not in the predicted direction. The supervisor for Groups 3, 4, and 5 received lower Supervisor Satisfaction scores than the supervisor for Groups 1 and 2.

The pattern of group means across incentive levels, shown at the bottom of Table 3, indicated that there may have been a performance differential between those working in the morning and those working in the afternoon. All employees in the 25, 75, and 125 percent sharing rate groups worked in the morning, and all in the 50 and 100 percent groups worked in the afternoon. This effect was tested in a two-factor nested design MANOVA, with sharing rate nested within the AM-PM effect. The results of this analysis were, however, not significant, F (18, 207) = 1.61, NS.

In testing the relationship between Performance and Job Satisfaction, the mean of employee performance on Days 3 and 4 was used to measure Performance. Intrinsic Job Satisfaction and Perceived Intrinsic Job Characteristics were measured at the beginning of Day 3, and the remaining elements of Job Satisfaction were measured at the beginning of Day 5. A one-way MANCOVA was performed to predict Job Satisfaction, with Performance, covaried by Ability, as the predictor. The hypothesized relationship of Performance to Job Satisfaction was supported, F (24, 368) = 2.96, $p < .001$. The

Table 2

Summary of Results of One-Way MANOVA to Test for

Relationship of Incentive Opportunity to Job Satisfaction

Scale/Subscale	$\overline{X}$	SD	F/t^1	df	p
Job Satisfaction	3.37	0.41	2.30	6, 93	.041
Intrinsic Job Satisfaction	3.82	0.48	1.64	98	.105
Perceived Intrinsic Job Characteristics	3.00	0.85	0.14	98	.886
Satisfaction with the Job Itself	2.80	0.82	2.17	98	.032
Pay Satisfaction	3.63	0.63	2.37	98	.020
Supervisor Satisfaction	3.98	0.58	0.73	98	.465
Co-Worker Satisfaction	3.64	0.56	1.91	98	.060

[1]Job Satisfaction: Wilks' lambda approximate F statistic; subscales: t statistic.

	Group Means	
Subscale	No Incentive	Incentive
Intrinsic Job Satisfaction	3.65	3.85
Perceived Intrinsic Job Characteristics	2.98	3.01
Satisfaction with the Job Itself	2.41	2.88
Pay Satisfaction	3.31	3.70
Supervisor Satisfaction	3.88	4.00
Co-Worker Satisfaction	3.41	3.69

Table 3

Summary of Results of One-Way MANOVA to Test for

Relationship of Incentive Level to Job Satisfaction

Scale/Subscale	$\overline{X}$	SD	F^1	df	p
Job Satisfaction	3.41	0.42	1.92	24, 256	.007
Intrinsic Job Satisfaction	3.85	0.49	0.32	4, 78	.867
Perceived Intrinsic Job Characteristics	3.01	0.82	1.57	4, 78	.191
Satisfaction with the Job Itself	2.88	0.85	1.23	4, 78	.303
Pay Satisfaction	3.70	0.58	1.16	4, 78	.336
Supervisor Satisfaction	4.00	0.62	3.45	4, 78	.012
Co-Worker Satisfaction	3.69	0.56	2.05	4, 78	.095

[1]Job Satisfaction: Wilks' lambda approximate F statistic; subscales: F statistic.

	Group Means				
Subscale	1(25%)	2(50%)	3(75%)	4(100%)	5(125%)
Intrinsic Job Satisfaction	3.91	3.93	3.81	3.88	3.76
Perceived Intrinsic Job Characteristics	2.80	2.63	3.26	3.04	3.20
Satisfaction with the Job Itself	2.76	2.67	3.23	2.72	2.98
Pay Satisfaction	3.64	3.98	3.57	3.79	3.59
Supervisor Satisfaction	4.17	4.33	3.63	4.10	3.84
Co-Worker Satisfaction	3.43	3.85	3.76	3.87	3.59

contribution of Ability as a covariate was significant, approximate F (6, 105) = 2.60, $p < .05$. Results of this analysis are shown in Table 4.

Univariate results revealed a positive relationship between Performance and Satisfaction with the Job Itself, F (4, 110) = 5.05, $p = .001$, and Pay Satisfaction, F (4, 110) = 8.40, $p < .001$. There was also a relationship between Performance and Co-Worker Satisfaction, but it was not in the predicted direction, F (4, 110) = 3.03, $p < .05$.

Contrary to prediction, Incentive Opportunity did not interact with Ability to relate to Job Satisfaction, F (24, 298) = 0.47, NS; nor did Incentive Level interact with Ability to produce a relationship with Job Satisfaction, F (84, 313) = 1.10, NS.

Intrinsic Job Satisfaction

As predicted, a 1-tailed t-test revealed that Incentive Opportunity was related to greater Intrinsic Job Satisfaction, t (104) = 1.65, $p = .05$, but was not associated with Perceived Intrinsic Job Characteristics, t (104) = 0.22, NS. Contrary to prediction, Incentive Level was related neither to Intrinsic Job Satisfaction, F (4, 83) = 0.38, NS, nor to Perceived Intrinsic Job Characteristics, F (4, 83) = 1.94, NS.[2]

Perceived Stress

As with the analyses of incentives and Job Satisfaction, tests for the relationship between Incentive Opportunity and Perceived Stress were performed with the Incentive groups collapsed across the five levels. One-way MANOVA results revealed that the hypothesized relationship of Incentive Opportunity to Perceived Stress was supported, F (6, 105) = 3.10, $p < .01$. One-way ANOVAs revealed that Incentive Opportunity was associated with less Boredom, t (110) = -2.39, $p < .05$, and greater Job Pressure, t (110) = 2.96, $p < .01$. Results of these analyses are found in Table 5. The hypothesis that Incentive Level would be associated with greater Perceived Stress was not supported, F (24, 245) = 0.52, NS.

As predicted, Performance, adjusted for Ability, was related to Perceived Stress, F (24, 354) = 1.93, $p < .01$, but generally not in the predicted direction. One-way ANCOVAs revealed that Performance was related to less Boredom, F (4, 106) = 5.01, $p = .001$, and less Workload Dissatisfaction, F (4, 106) = 2.44, $p = .05$. Results of these analyses are summarized in Table 6.

A t-test was performed to test the relationship between Incentive Opportunity and Boredom. As predicted, Incentive Opportunity was associated with decreased Boredom, t (117) = 2.67, $p < .01$.[3] A one-way ANOVA revealed that the predicted inverse relationship between Incentive Level and Boredom was not supported, F (4, 81) = 1.25, NS.

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[2]Results reported here differ slightly from results shown in Tables 2 and 3 because of cases lost in the multivariate analyses. These cases were lost due to missing data in some of the Job Satisfaction subscales.

[3]Results reported here differ slightly from results shown in Table 5 because of cases lost in the multivariate analyses. These cases were lost due to missing data in some of the Perceived Stress subscales.

Table 4

Summary of Results of One-Way MANCOVA to Test for Relationship of Performance, Adjusted for Ability, to Job Satisfaction

Scale/Subscale	$\bar{X}$	SD	F^1	df	p
Job Satisfaction	3.36	0.43	2.96	24, 368	<.001
Intrinsic Job Satisfaction	3.80	0.50	1.25	4, 110	.295
Perceived Intrinsic Job Characteristics	2.99	0.86	1.22	4, 110	.308
Satisfaction with the Job Itself	2.80	0.83	5.05	4, 110	.001
Pay Satisfaction	3.62	0.63	8.40	4, 110	<.001
Supervisor Satisfaction	3.98	0.58	1.11	4, 110	.355
Co-Worker Satisfaction	3.69	0.55	3.03	4, 110	.020

[1]Job Satisfaction: Wilks' lambda approximate F statistic; subscales: F statistic.

	Group Means[2]				
Subscale	1	2	3	4	5
Intrinsic Job Satisfaction	3.68	3.66	3.80	3.85	3.96
Perceived Intrinsic Job Characteristics	3.03	2.69	3.20	3.03	3.00
Satisfaction with the Job Itself	2.57	2.41	2.92	2.77	3.23
Pay Satisfaction	3.91	3.22	3.29	3.76	3.90
Supervisor Satisfaction	4.10	3.81	3.94	3.92	4.12
Co-Worker Satisfaction	3.90	3.80	3.45	3.80	3.53

[2]Employees divided into five equal groups by Performance scores.

Table 5

Summary of Results of One-Way MANOVA to Test for

Relationship of Incentive Opportunity to Perceived Stress

Scale/Subscale	$\overline{X}$	SD	F/t^1	df	p
Perceived Stress	3.00	0.36	3.10	6, 105	.008
Boredom	3.49	1.02	-2.39	110	.018
Job Pressure	3.41	0.60	2.96	110	.004
Workload Dissatisfaction	2.14	0.66	1.85	110	.066
Job Content Stress	4.12	0.59	0.43	110	.668
Workload Stress	3.02	0.91	1.20	110	.234
Environmental Stress	2.54	0.48	1.35	110	.180

[1]Perceived Stress: Wilks' lambda approximate F statistic; subscales: t statistic.

	Group Means	
Subscale	No Incentive	Incentive
Boredom	3.84	3.35
Job Pressure	3.16	3.52
Workload Dissatisfaction	1.96	2.21
Job Content Stress	4.08	4.13
Workload Stress	2.86	3.09
Environmental Stress	2.44	2.58

Table 6

Summary of Results of One-Way MANCOVA to Test for Relationship of Performance, Adjusted for Ability, to Perceived Stress

Scale/Subscale	$\overline{X}$	SD	F^1	df	p
Perceived Stress	3.00	0.36	1.93	24, 354	.006
Boredom	3.49	1.02	5.01	4, 106	.001
Job Pressure	3.41	0.60	1.11	4, 106	.355
Workload Dissatisfaction	2.14	0.66	2.44	4, 106	.052
Job Content Stress	4.12	0.59	0.72	4, 106	.581
Workload Stress	3.02	0.91	1.44	4, 106	.227
Environmental Stress	2.54	0.48	0.71	4, 106	.587

[1]Perceived Stress: Wilks' lambda approximate F statistic; subscales: F statistic.

	Group Means[2]				
Subscale	1	2	3	4	5
Boredom	3.88	3.95	3.35	3.46	2.92
Job Pressure	3.42	3.26	3.37	3.35	3.62
Workload Dissatisfaction	2.26	2.03	2.46	2.15	1.84
Job Content Stress	4.21	4.13	4.12	4.18	3.98
Workload Stress	2.89	2.95	3.41	2.85	3.02
Environmental Stress	2.42	2.63	2.58	2.59	2.49

[2]Employees divided into five equal groups by Performance scores.

An inverse relationship was predicted between Performance, with Ability as a covariate, and Boredom. A one-way ANCOVA provided support for this hypothesis, F (4, 114) = 4.67, p = .001, although controlling for Ability did not add to the prediction.[4]

DISCUSSION

General Observations on the Results

An initial observation to be made regarding these results is that the relationships reported here, though often highly significant, did not account for large amounts of the total variance. Such findings are not surprising; stress and satisfaction variables operate in a complex fashion, influenced not only by the incentive treatments, but also by many individual and environmental moderator variables not measured in this study. The results found in articles reviewed showed that researchers in the areas of job satisfaction and stress are accustomed to relationships in the ranges found in this study.

A second general observation that must be considered is that multivariate criterion variables, since they are composed of several variables (in this case, subscales of larger constructs), may relate to predictors in a complex fashion. In other words, a simple positive or negative relationship may not exist. Rather, such relationships may be composed of combinations of positive and negative relationships among the criterion variables, especially in the case of a complex construct, such as stress. It will be recalled that Boredom, though a component of overall Perceived Stress in this study, was hypothesized to relate negatively to Incentives and Performance, while overall Perceived Stress was hypothesized to relate positively to these two predictors.

The implication of the nature of these multivariate relationships is that hypotheses will rarely be fully supported. That is, while some elements, or subscales, in the general constructs of Job Satisfaction or Perceived Stress may relate to Incentives or Performance in the predicted fashion, others may not relate, or may relate opposite to the predicted direction.

Examination of the Results

The results provided general support for the positive relationship between Incentive Opportunity and Job Satisfaction. Employees with the opportunity to earn incentives expressed more overall satisfaction than those in the control group, as evidenced by their greater Satisfaction with the Work Itself and greater Pay Satisfaction. The four remaining subscales, though failing to reach significance, all tended in a positive direction. In addition, Incentive Level was significantly related to Job Satisfaction, but the direction of this relationship was mixed. The only significant univariate relationship with Incentive Level was Supervisor Satisfaction, but it was contrary to the predicted direction. As shown in Table 3, most of the nonsignificant results tended to be in a positive direction, although the only positive tendency that approached significance was Co-Worker Satisfaction. The results, therefore, are equivocal with respect to the relationship between Incentive Level and Job Satisfaction. Clearly, the hypothesized

[4]Results reported here differ slightly from results shown in Table 6 because of cases lost in the multivariate analyses. These cases were lost due to missing data in some of the Perceived Stress subscales.

positive relationship was not supported, and there is some suggestion of a negative relationship.

This finding of a negative relationship between Co-Worker Satisfaction and Incentive Level is unexplained, although several possible interpretations exist. Since the relationship was not particularly strong, it may have been a chance finding. Alternatively, this finding may have been the result of a supervisor effect or a worksite effect. Supervisor Satisfaction mean scores for Groups 3, 4, and 5 (the 75, 100, and 125 percent Sharing Rate conditions) were lower than the scores for Groups 1 and 2 (the 25 and 50 percent Sharing Rate conditions). This dichotomy of mean scores corresponded to employee assignments by supervisor and work site.

In order to investigate the possibility of a worksite effect, the results of the Perceived Stress subscale of Environmental Stress was checked. Environmental Stress measured, among other things, how pleasant and comfortable the work area was. Employees registered no difference on this measure by work site. Although many possible explanations for this Co-Worker Satisfaction difference could be proposed, additional data would be required to provide an answer to this puzzling finding. It should be noted that the Supervisor Satisfaction scores were high even across all conditions, as shown in Table 3.

Performance, adjusted for Ability, bore a generally positive relationship to Job Satisfaction. The subscales of Satisfaction with the Job Itself and Pay Satisfaction were positively related to Performance, but Co-Worker Satisfaction was negatively related to Performance. It is possible that higher performers were more task-oriented, and thereby less inclined to foster and report friendships with co-workers than poorer performing employees. The mean scores for Co-Worker Satisfaction did not indicate dissatisfaction with fellow workers at any level of performance, as Table 4 indicates. On the contrary, it appeared that even the highest performing employees were satisfied with their fellow workers, though not to the degree of the lower performing employees.

Neither Incentive Opportunity nor Incentive Level interacted with Ability to increase the relationship with Job Satisfaction. The lack of support for this result may have been due to the somewhat lengthy chain of relationships upon which this hypothesis depended. No direct evidence of this hypothesized relationship was found in the literature, though there was indirect evidence, as outlined in the literature review.

There was partial support for the hypothesized relationship between Incentives and Intrinsic Job Satisfaction, which was positively related to Incentive Opportunity but not to Incentive Level. Perceived Intrinsic Job Characteristics was not related to any incentive measure, but *t* values were in the predicted direction. The relationship between Incentive Opportunity and Intrinsic Job Satisfaction, while not particularly strong, is in direct contradiction to the predictions of Deci's (1975) cognitive evaluation theory of extrinsic motivation, and supports the predictions of expectancy theory (Ilgen et al., 1981; Nebeker et al., 1978).

Perceived Stress was related to Incentive Opportunity, but, once again, in a complex fashion. Boredom was lower for those with an opportunity to earn incentives, but job pressure was higher. In addition, Workload Dissatisfaction was marginally higher, and the other Perceived Stress subscales also tended to be higher. The bulk of the evidence appears to support an increase in Perceived Stress for those with the opportunity to earn incentives. Apparently, boredom, a stressor generally without serious effects, was

replaced by other stressors that may have long-term psychological and physiological effects (Harris & Berger, 1983; Sales, 1970; Thackray, 1981).

In contrast to the relationship between Perceived Stress and Incentive Opportunity, there was no relationship between Incentive Level and Perceived Stress. Apparently, the level of incentive offered had no effect on employees' perceptions of stress, at least within the ranges examined in this study. One possible explanation for this lack of findings is that even the lowest incentive level in this study may have been set too high to discover differences in stress due to the incentive level. Another possibility is that the Perceived Stress scale used in this study may not have been reliable enough to obtain differences across incentive conditions that may have existed.

Finally, there may have been too much within-group variance to observe a relationship that may exist. For instance, the hypothesized relationship did not control for the amount of incentive actually earned within the incentive conditions. It is possible that stress is perceived only by those who are motivated to earn incentives. In a test of this possibility, incentive condition was covaried by the amount of incentive actually earned on days 3 and 4. This MANCOVA, however, did not yield a significant relationship.

The results were more supportive of the relationships of Incentive Opportunity and Performance to Boredom. The hypothesized negative relationships were supported, although controlling for Ability did not increase this relationship.

The results did reveal a relationship between Performance, adjusted for Ability, and Perceived Stress. Contrary to prediction, however, the relationship appeared to be generally negative. The only two subscales that were significantly related to Performance, Boredom and Workload Dissatisfaction, were negatively related. The other subscales showed no pattern.

These results indicate that higher performance does not necessarily increase the perception of stress, and may actually lead to decreased stress. It is possible, however, that the employees in this study did not perceive higher stress because the perception was mediated by the chance to earn incentives. This possibility was investigated via a one-way MANCOVA, but the results still indicated decreased Perceived Stress, as reflected by decreased Boredom and Workload Dissatisfaction.

As alluded to in the above paragraphs, Boredom had a significant negative relationship with both Incentive Opportunity and Performance. These results replicate earlier findings (Turner & Miclette, 1962; Wyatt & Fraser, 1929). The failure to find a relationship between Incentive Level and Boredom can probably be explained by the same reasons advanced for Incentive Level and Perceived Stress, that even the lowest level of incentive offered may have been too high to discover differences in stress due to the incentive level. The incentive levels used in this study did not permit discrimination across levels, probably due to the relationship having become asymptotic.

An important point to consider with all these analyses is that the relationships reported are multivariate, and as such are not the clean, unequivocal relationships found in univariate analyses. Indeed, despite the fact that the results are "messy" in this respect, and therefore somewhat difficult to interpret, they are important precisely because of their complexity. Taken as a whole, they provide a clear illustration of the multivariate character of job satisfaction and stress. The multivariate analyses used in

this study were particularly appropriate for testing the hypothesized relationships of these multivariate constructs. What is more, the multivariate tests provided a more complete picture of the overall relationships among these variables than univariate tests.

The lack of strength of the results is cause for some reflection. The design of this study may not have been optimum for discovering a relationship between incentives and perceived stress. Though the study was an organizational simulation and was viewed as work by the employees, the underlying design was nevertheless experimental. As an experimental design, the study was planned to control for as much extraneous variance as possible, while retaining the realism of a work environment. However, measurement of stress with a self-report measure may not necessarily provide a complete indication of physiological or psychological stress. It is possible to see a measurable increase in physiological symptoms without a reported increase in perceived stress (Eden, 1982), possibly because psychological symptoms may not be measured reliably by self-reports. Cox (1985) argued that there are no physiological measures of stress per se, only physiological correlates or indicators of stress. Therefore, physiological symptoms are not actually measures of stress itself. Perceived stress is what is experienced as stressful by the individual, regardless of the presence or absence of physiological responses. For a review of the relationship of self-report measures of stress to physiological indicators, see Cooper (1987).

Bridges (1974) and McGrath (1976) have noted that in laboratory experiments it is very difficult to create the stress intensity of an actual work situation. Bridges indicated that laboratory settings are not generally able to produce stress with the reliability and intensity of real-life situations because of a reduced environmental impact and less individual involvement. In addition, no matter how realistic the laboratory setting is, subjects know that there can be no long-term payoff for superior performance, such as promotion or recognition. The reduced environmental intensity of experiments may also be true of this organizational simulation, if to a lesser degree. In this design, some of the elements that often occur in a work environment were removed or controlled, such as interaction with other organizations or other departments within one's own organization, variability in the work, and the need to adjust to changing requirements.

The relationship of Incentives to Perceived Stress may have been greater with a scale that exhibited greater reliability. The low reliability of some of the subscales (Workload Dissatisfaction, alpha = .67; Environmental Stress, alpha = .50) was enough to greatly reduce the chance that they would relate to anything. Future research should attempt to develop a Perceived Stress scale that measures the components of stress with greater reliability.

Finally, significant individual and environmental moderators that were not covered in this study may have been operating during the study, for example, work strategies (such as self-imposed work breaks), Type A behavior pattern, self-esteem, stress-coping mechanisms, or locus of control. Environmental moderators were controlled to the greatest extent possible, but there were nevertheless minor differences in the size and shape of the two workrooms and their proximity to various facilities. These elements may have had a differential effect on performance in the various work groups.

Considering the nature of the employee sample, the short time period of the study, and the type of work performed, some caution should be exercised in applying these results to work in different situations. Nevertheless, the results appear to represent a

substantial advance in understanding the way performance standards and incentives relate to job satisfaction and perceived stress.

Implications for Future Research

Future research should investigate the exact shape of the relationship of job satisfaction and its component parts to sharing rate, or incentive level. Such research would enable researchers and practitioners to understand the point at which further increases in incentive sharing rate no longer increase job satisfaction. In the same vein, research should be conducted to determine the exact shape of the relationship of perceived stress and its component parts to sharing rate. Through such research, the points at which the specific elements of stress increase or decrease in magnitude could be determined.

In addition, future research should investigate the relationship between performance and stress under incentive and nonincentive conditions. In this way, researchers could determine what, if any, differences in stress exist under these conditions. This research should include physiological measures of stress as well as measures of perceived stress.

The perceived stress construct should be further developed through follow-on research. In particular, the development of a perceived stress scale with greater component and overall reliability merits attention. This development should also include research to ascertain the relationships between perceived stress and the various physiological indicators of stress.

Finally, future research should investigate the moderating effects of individual differences on the relationships of incentives and performance to job satisfaction and perceived stress. In particular, the moderating effects of the Type A behavior pattern merits research attention, not only because of the effect of Type A on performance, but also because of its complex relationship to stress (Friedman & Rosenman, 1974; Price, 1982).

In order to facilitate the above suggestions for future research, repeated-measures, or within-subjects, designs should be incorporated to enhance the ability to measure treatment effects. By using within-subjects designs, employees or experimental subjects function as their own control condition, thus eliminating error due to between-subjects differences (Keppel, 1973). Repeated-measures designs are not without disadvantages, however. In order to minimize carry-over effects, the ordering of treatments must be counterbalanced (Keppel, 1973).

Such designs can be effectively undertaken in organizational simulations. Simulations allow the researcher to recreate many of the characteristics of an actual organizational environment, while enabling a large measure of control over experimental conditions. In this manner, organizational realism, experimental control, and high quality behavior measurement can be achieved simultaneously.

CONCLUSIONS

1. The introduction of monetary incentives into the workplace is associated with greater overall job satisfaction. Monetary incentives are related to increased intrinsic job satisfaction, satisfaction with the job itself, and pay satisfaction.

2. Higher employee performance is associated with greater overall job satisfaction, satisfaction with the job itself, and pay satisfaction.

3. Monetary incentives and higher employee performance are not related to overall stress. They are, however, related to individual elements of perceived stress, with some elements positively related, and some negatively related to monetary incentives and performance. Boredom is negatively related to both monetary incentives and higher performance.

4. No consistent relationship could be demonstrated between the level of incentive offered and either job satisfaction or perceived stress.

RECOMMENDATIONS

1. All Navy activities with existing monetary incentive programs should be cognizant of the effects of these programs on employee job satisfaction and perceived stress. Aspects of these programs suspected of substantially increasing employee stress or reducing job satisfaction should be modified to return these job outcomes to acceptable levels.

2. Navy activities implementing new monetary incentive programs should design them to align organizational goals with employee outcomes so that goals and job satisfaction can be jointly optimized, while perceived stress is minimized.

3. Further research should be undertaken to investigate the exact shape of the relationship of job satisfaction and its component parts to incentive level. Such research would enable researchers and practioners to understand the point at which further increases in incentive sharing rate no longer increase job satisfaction.

4. Further research should also be conducted to determine the exact shape of the relationship of perceived stress and its component parts to incentive level. Through such research, the points at which the specific elements of stress increase or decrease in magnitude could be determined.

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APPENDIX A

PERFORMANCE EFFICIENCY REPORT

PERFORMANCE EFFICIENCY REPORT

The Performance Efficiency Report shown in Figure A-1 is representative of feedback reports given to the incentive groups, Groups 1 through 5. The feedback report depicted is for Day 5, containing the employee's performance for the previous four days. The first column contains a three-digit employee identification number, the first digit designating the employee's assigned group, and the last two digits being a unique identification number for each individual in the group. (A fourth digit used in conjunction with the ID number, but not shown on the Performance Efficiency Report, represented the day of the week.) The third column presents daily and weekly totals of questionnaires completed.

The fourth column presents the number of hours spent performing productive work. This column excludes time either not at work, or at work but engaged in training, responding to attitude instruments, or other administrative activities. The fifth column displays questionnaires per hour completed, using the data from columns three and four. The sixth column presents the employee's error rate, computed by comparing the employee's coded answers with the master file. (Employees were told that this figure represented the percent of coded answers that did not match the answers of an employee from another group who coded the same questionnaire for verification purposes.)

The seventh column displays the employee's percent performance efficiency, obtained by dividing column five by the performance standard of 5.75 questionnaires per hour. The eighth column presents daily and total hours worked. In contrast to column four, this figure includes all hours at the work site, excluding only time missed due to absence, tardiness, or early departure.

Column nine is a computation of base pay earned, computed by multiplying hours from column eight by the $4.40 per hour base pay rate. Column 10 presents incentive pay earned, and is computed using the employee's performance efficiency in excess of 100 percent and the sharing rate for the employee's group. The employee whose sample feedback report is shown in Figure A-1 was in the 25 percent sharing rate group. Incentive pay computation will be discussed in greater detail in Appendix B. Column 11 is a summation of base pay and incentive pay.

Employees in Group 6, the Performance Standard Group, received Performance Efficiency Reports that excluded columns 10 and 11. The reports for Group 7, the No Standard Group, excluded the data in columns 7, 10, and 11.

NAVY QUESTIONNAIRE CODING CONTRACT

PERFORMANCE EFFICIENCY REPORT

1	2	3	4	5	6	7	8	9		10		11
ID #	DAY	QS COMP	PHRS	Q/HR	% ERR	% PERF EFF	THRS	EARNINGS		INCENTIVE PAY		TOTAL PAY
104	Mon	7.00	1.1	6.36	.31	110.67	4.0	17.60	+	.47	=	18.07
	Tues	21.00	3.7	5.68	2.70	98.71	4.0	17.60	+		=	17.60
	Wed	17.00	3.2	5.31	1.07	92.39	4.0	17.60	+		=	17.60
	Thu	22.00	3.9	5.64	2.70	98.10	3.9	17.16	+		=	17.16
Total	4	67.00	11.9	5.748	1.693	99.969	15.9	69.96	+	.47	=	70.43

Figure A-1. Example of performance feedback report given to incentive groups 1-5.

APPENDIX B

COMPUTATION OF INCENTIVE PAY

COMPUTATION OF INCENTIVE PAY

Employees in Groups 1 through 5 earned incentive pay in addition to base pay for all daily performance with a Performance Efficiency exceeding 100 percent. Performance Efficiency is the ratio of actual performance to the Performance Standard, expressed as a percentage. Sharing Rate is the percentage of the Performance Efficiency exceeding 100 percent which is shared with the employees. Sharing Rates for incentive conditions ranged from 25 to 125 percent, as shown in Figure 1. Employees were not aware of the method of payment in groups other than their own, and did not express interest in discovering either the methods or the amounts of pay earned in other groups.

Total pay for each day was determined using the following formula:

$$TP = \left(\left[\left(\frac{Q/HR}{PS} - 1\right) SR\right] + 1\right) TH \times BP$$

where:

TP = total pay
Q/HR = questionnaires coded per production hour (> PS)
PS = Performance Standard (5.75 Q/HR)
SR = Sharing Rate
TH = total hours
BP = base pay rate ($4.40 per hour)

For example, if an employee in the 75 percent Sharing Rate condition completed 7.5 questionnaires per hour on day 1, the employee's earnings for that day would be computed as follows:

$$TP = \left(\left[\left(\frac{7.50}{5.75} - 1\right).75\right] + 1\right) 4 \times \$4.40$$

$$= [(.3043 \times .75) + 1]\ 4 \times \$4.40$$

$$= 4.9132 \times \$4.40$$

$$= \$21.62$$

Pay for each subsequent day is computed in the same manner and added to previously earned pay.

As the formula indicates, employees were not penalized for work hours not spent in actual productive work. The example shown in Figure A-1 illustrates this point. Although the employee had only 1.1 productive hours (column four) on Monday, the Performance Efficiency of 110.67 percent was applied to the entire 4-hour workday. If the employee was at work less than the entire 4 hours, as this employee was on Thursday (see column nine), base pay earned was decreased proportionally. If the employee exceeded the Performance Standard on a "short" day such as this, incentive pay would be computed using the decreased amount of base pay earned.

APPENDIX C

SCALES AND SCALE ITEM STATISTICS

WORK SATISFACTION QUESTIONS

The following questions concern the degree of satisfaction you have with your job, supervisor, pay, and co-workers. Please read each statement carefully and circle the response that best represents your opinion.

	Strongly Disagree	Disgree	Neither Disagree Nor Agree	Agree	Strongly Agree
1. My co-workers are usually uncooperative.	1	2	3	4	5
2. Considering the work that is required, pay for this job is good.	1	2	3	4	5
3. My supervisor does a good job.	1	2	3	4	5
4. I am not satisfied with my supervisor's job performance.	1	2	3	4	5
5. In general, I am satisfied with the relationship I have with my co-workers.	1	2	3	4	5
6. I am satisfied with my pay.	1	2	3	4	5
7. Compared to pay rates of other area companies for similar work, my pay is good.	1	2	3	4	5
8. My job does not challenge me.	1	2	3	4	5
9. I am not paid enough for the level of my performance.	1	2	3	4	5
10. My job gives me a sense of accomplishment.	1	2	3	4	5
11. My supervisor is very competent and knows his/her job well.	1	2	3	4	5
12. My co-workers make my job more pleasant.	1	2	3	4	5
13. My work is interesting.	1	2	3	4	5

	Very Satisfied	Somewhat Satisfied	Not too Satisfied	Not at all Satisfied
14. All in all, how satisfied would you say you are with your job?	1	2	3	4

	Decide Without Hesitation to Take the Same Job	Have Some Second Thoughts	Decide Definitely not to Take the Job
15. Knowing what you now know, if you had to decide all over again whether to take the job you now have, what would you decide?	1	2	3

	I Would Like to Keep This Job	I Would Like to Quit and Not Work at All	I Would Like to Have Another Job
16. If you were free to go into any type of job you wanted, what would your choice be?	1	2	3

Table C-1

Means, Standard Deviations, and Item Intercorrelations
for Job Satisfaction Scale

Item	$\bar{X}$	SD	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	3.86	.95	119															
2	3.74	.78	118	.11														
3	4.07	.69	119	.04	.29***													
4	4.05	.86	119	.12	.20*	.41***												
5	3.71	.63	119	.17*	.19*	.07	.00											
6	3.66	.83	119	.10	.66***	.14	.26**	.10										
7	3.62	.76	119	-.02	.49***	.13	.07	.19*	.50***									
8	2.64	1.18	119	-.08	-.05	.18*	.10	-.13	.07	.01								
9	3.47	.80	119	.00	.50***	.07	.03	.02	.46***	.34***	.06							
10	3.03	1.04	119	-.11	.01	.20*	.12	-.07	.15	-.02	.50***	.07						
11	3.80	.70	119	.15	.17*	.54***	.27***	.02	.07	.14	.09	.07	.18*					
12	3.50	.70	119	.29***	.11	.14	.03	.31***	.00	.07	-.09	.12	-.06	.24**				
13	2.35	1.19	119	.00	-.08	.07	.00	-.11	-.01	-.02	.36***	.09	.61***	.10	.06			
14	2.84	.68	119	.02	.19*	.21*	.25**	-.01	.25**	.16*	.32***	.17*	.50***	.26**	.12	.50***		
15	2.54	.62	119	.10	.04	.21**	.14	.06	.12	.15	.37***	.15*	.48***	.23**	.14	.45***	.47***	
16	1.45	.82	119	.12	.00	.10	.11	.05	.03	.05	.24**	-.02	.30***	.04	-.03	.45***	.31***	.31***

Note: Items 1, 4, 8 ,9, 14, 15, and 16 are reverse-scored.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

INTRINSIC JOB SATISFACTION QUESTIONS

People differ in how much satisfaction they get from their job. For each statement circle the answer which best describes how much you agree with each statement.

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
1. I feel a sense of personal accomplishment when I do this job well.	1	2	3	4	5
2. My opinion of myself goes down when I do this job badly.	1	2	3	4	5
3. I take pride in doing this job as well as I can.	1	2	3	4	5
4. I feel unhappy when my work does not meet my personal standards.	1	2	3	4	5
5. I like to look back on the day's work with a sense of a job well done.	1	2	3	4	5
6. I try to think of ways to do my job more effectively.	1	2	3	4	5

PERCEIVED INTRINSIC JOB CHARACTERISTICS QUESTIONS

Below you will find several job features which some jobs may have. For each job feature, please choose the statement which best describes how much each feature is present in this job.

	None of It	Little of It	Moderate Amount of It	A Lot of It	A Great Deal of It
1. The freedom to choose your own method of work	1	2	3	4	5
2. The amount of responsibility you are given	1	2	3	4	5
3 The recognition you get for good work	1	2	3	4	5
4. Being able to judge your own performance while actually doing the job	1	2	3	4	5
5. Your opportunity to use your abilities	1	2	3	4	5
6. The amount of variety in your job	1	2	3	4	5
7. The feeling of doing something important and worthwhile	1	2	3	4	5
8. Doing a whole and complete piece of work	1	2	3	4	5

Table C-2

Means, Standard Deviations, and Item Intercorrelations for Intrinsic Job Satisfaction Scale

Item	$\overline{X}$	SD	N	1	2	3	4	5
1	3.95	.73	124					
2	3.06	.99	124	.23**				
3	3.82	.82	125	.60***	.24**			
4	3.84	.72	125	.15*	.45***	.14		
5	3.92	.73	124	.33***	.19*	.34***	.31***	
6	4.15	.79	124	.28***	.17*	.21**	.36***	.41***

Note: All items are reverse-scored.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table C-3

Means, Standard Deviations, and Item Intercorrelations for Perceived Intrinsic Job Characteristics Scale

Item	$\overline{X}$	SD	N	1	2	3	4	5	6	7
1	3.43	1.11	124							
2	3.23	1.12	124	.62***						
3	2.72	1.15	124	.25**	.36***					
4	3.55	.95	124	.25**	.17*	.34***				
5	2.93	1.36	124	.45***	.61***	.54***	.33***			
6	2.05	1.31	124	.34***	.48***	.62***	.30***	.71***		
7	2.60	1.24	124	.34***	.58***	.63***	.24**	.71***	.75***	
8	3.24	1.19	124	.38***	.54***	.39***	.32***	.60***	.47***	.66***

* $p < .05$.
** $p < .01$.
*** $p < .001$.

WORK STRESS QUESTIONS

The following questions ask how you feel about various aspects of your job. Circle the answer which best describes how you feel.

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
1. My job responsibilities are clearly defined.	1	2	3	4	5
2. The amount of work I have to do interferes with how well it gets done.	1	2	3	4	5
3. The time requirements for completing my work are realistic.	1	2	3	4	5
4. I have enough space to perform my work adequately.	1	2	3	4	5
5. There are adequate facilities/refreshments available for work breaks.	1	2	3	4	5
6. The work area (room, chairs, tables) is pleasant and comfortable.	1	2	3	4	5
7. My job requires me to work very fast.	1	2	3	4	5
8. My job requires me to work very hard.	1	2	3	4	5
9. I have time to think and contemplate.	1	2	3	4	5
10. There is a great deal of work for me to do.	1	2	3	4	5
11. There is enough time for me to do my work.	1	2	3	4	5
12. There is constant pressure to increase my productivity.	1	2	3	4	5
13. My job requires me to work very neatly.	1	2	3	4	5
14. My job requires a great deal of accuracy.	1	2	3	4	5

	No Stress	Almost No Stress	A Little/ Occasional Stress	Moderate/ Frequent Stress	A Great Deal of/ Almost Constant Stress
15. The workload is such that I feel:	1	2	3	4	5
16. The workload is such that my co-workers seem to feel:	1	2	3	4	5

	Rarely, Never	Occa-sionally	Some-times	Fairly Often	Very Often
17. My work is interesting to do.	1	2	3	4	5
18. I dislike the amount of work I'm expected to do.	1	2	3	4	5
19. I feel bored with the work I have to do.	1	2	3	4	5
20. I am dissatisfied with the pace of my work.	1	2	3	4	5
21. The work on my job feels dull.	1	2	3	4	5
22. I am unhappy about my current work load.	1	2	3	4	5

Table C-4

Means, Standard Deviations, and Item Intercorrelations
for Perceived Stress Scale

Item	$\bar{X}$	SD	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	4.18	.61	119																					
2	3.03	.94	119	-.07																				
3	2.33	.63	118	-.20*	.11																			
4	3.81	.75	119	.24**	-.09	-.12																		
5	2.49	.98	119	-.06	.05	.19*	-.15																	
6	2.71	.88	119	.02	.06	.13	-.20*	.27**																
7	3.75	.84	119	.09	.26**	.06	-.01	-.08	.01															
8	3.44	.92	118	.16*	.26**	.00	-.02	-.21**	-.13	.62***														
9	2.89	.85	119	.07	-.05	.14	.01	.11	.16*	.09	.11													
10	3.55	.79	119	.01	.18*	.03	.01	-.06	-.11	.41***	.29***	-.01												
11	2.29	.64	118	-.09	.26**	.29***	-.02	.10	.18*	.09	-.07	.16*	.17*											
12	3.14	1.02	118	.00	.34***	.08	.01	.00	-.01	.32***	.40***	.13	.24**	.18*										
13	3.97	.71	119	.23**	-.20*	.00	.21**	-.12	-.15	-.11	.04	.08	-.08	-.23**	.12									
14	4.27	.59	119	.39***	-.20*	-.06	.29***	-.05	.01	.12	.13	.18*	.02	.00	.01	.58***								
15	3.03	.95	118	.14	.24**	.14	-.09	.03	.05	.30***	.24**	.08	.21*	.15	.42***	.13	.09							
16	3.03	.95	116	.16*	.09	.11	-.12	.05	.11	.21*	.13	.01	.23**	.10	.22**	.08	.08	.85***						
17	3.87	1.00	119	.10	-.28***	.06	.15	-.08	.12	-.06	-.11	.20*	-.07	-.02	-.17*	.10	.12	-.10	-.06					
18	1.96	.94	119	-.03	.13	.13	-.10	.13	.03	.17*	.14	-.03	.18*	.13	.17*	.02	-.09	.31***	.16*	.18*				
19	3.24	1.34	119	.05	-.19*	.02	.11	-.07	.22**	.06	-.05	-.07	.10	-.04	-.13	.02	.05	-.01	.03	.57***	.26**			
20	2.38	1.07	119	-.04	.04	.36***	-.05	.04	.05	.15	.03	.23**	.06	.16*	.18*	.16*	.05	.11	.14	.14	.17*	.04		
21	3.34	1.28	119	.21*	-.20*	.04	.22**	-.08	.14	-.02	-.15	-.11	.08	-.10	-.12	.07	.13	.02	.10	.53***	.19*	.65***	.21*	
22	1.86	.95	119	.06	.19*	.32***	-.09	.09	.09	.17*	.09	.02	.23**	.08	.28***	-.01	-.08	.29***	.26**	.17*	.51***	.19*	52***	.36***

Note: Items 1, 2, 4, 7, 8, 10, 12, 13, 14, and 17 are reverse scored.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table C-5

Means, Standard Deviations, Correlations, and Reliabilities
for Scales and Component Factors

Scale/Factor	$\bar{X}$	SD	N	1	1a	1b	1c	1d	2	3	4	4a	4b	4c	4d	4e	4f
1. Job Satisfaction	3.27	.38	118	(.73)													
a. Satisfaction with the Job Itself	2.48	.66	119	.76***	(.79)												
b. Pay Satisfaction	3.62	.62	118	.57***	.09	(.79)											
c. Supervisor Satisfaction	3.97	.58	119	.58***	.23**	.22**	(.66)										
d. Co-Worker Satisfaction	3.69	.54	119	.36***	-.03	.14	.16*	(.49)									
2. Intrinsic Job Satisfaction	3.79	.51	124	.41***	.34***	.25**	.28***	-.06	(.70)								
3. Perceived Intrinsic Job Characteristics	2.97	.87	124	.38***	.56***	-.07	.19*	-.05	.30***	(.88)							
4. Perceived Stress	3.12	.34	112	-.20*	-.22*	-.05	-.07	-.04	.11	-.28**	(.71)						
a. Boredom	3.48	1.03	119	-.47***	-.71***	.04	-.13	.05	-.27**	-.52***	.52***	(.80)					
b. Job Pressure	3.39	.62	117	.25**	.35***	.01	.13	-.08	.38***	.21*	.57***	-.16*	(.71)				
c. Workload Dissatisfaction	2.14	.65	118	-.29***	-.19*	-.13	-.24**	-.11	-.12	-.18	.69***	.29***	.26**	(.67)			
d. Job Content Stress	4.12	.58	119	.03	-.11	.10	.09	.10	.08	-.03	.26**	.10	-.02	.02	(.73)		
e. Workload Stress	3.03	.91	116	-.02	.14	-.18*	.00	-.13	.15	.11	.55***	.00	.36***	.27***	.11	(.92)	
f. Environmental Stress	2.54	.47	117	-.05	.02	-.08	-.08	.02	.09	-.24**	.42***	.03	.05	.35***	-.07	.14	(.50)

Note: Coefficient alpha reliabilities are displayed in parentheses along the diagonal.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

APPENDIX D

SUPERVISOR SCRIPT FOR TRAINING AND WORK RULES

SUPERVISOR SCRIPT FOR TRAINING AND WORK RULES

Appendix D contains all the information prepared for the supervisors of the work groups. As in the original package, included here are (a) a table showing the planned work schedule (Table D-1), (b) an outline of supervisor instructions, and (c) the supervisor's script for training and work rules.

Table D-1

Work Schedule

Time	Monday	Tuesday	Wednesday	Thursday	Friday
0730(1200)	Roll call; orientation	Explanation of report	Questionnaire	Work Begins	Questionnaire
0740(1220)	Training				
0748(1218)	Practice				
0755(1225)		Work begins			
0820(1250)	Work sample				
0830(1300)	Incentive instructions		Work begins		Work begins
0845(1315)	Questionnaire				
0930(1400)	Work begins				
1100(1530)					Work ends
1130(1600)	Work ends	Work ends	Work ends	Work ends	Debriefing

Outline of Instructions for Supervisors

I. Introduction
   A. Your name
   B. Purpose of job
   C. Brief description of job
   D. Roll call
   E. Housekeeping
      1. Time cards
      2. Parking
      3. Paychecks
      4. Dismiss selected people
   F. Employee numbers

II. Training
   A. Preparation for "work sample"
   B. Purpose of "work sample"
   C. Evaluation criteria (neat, accurate, quick)
   D. General description of FEQ
   E. Filling out initial information (Side Two)
      1. Identification number
      2. Question #2 information in "special codes"
      3. Questions 4-15 in "name" section
   F. Filling out questions 16-190 (Side One and Side Two)
   G. Rules
      1. Sequence of answers
      2. Errors
      3. Stray marks and smudges
      4. Multiple responses
      5. No response
   H. Procedures
      1. Providing questionnaires and answer sheets
      2. Pencils
      3. Completed work
      4. Talking
      5. Breaks
      6. Bending answer sheets
   I. Questions?

III. Practice: 3 questionnaires passed out to each
   A. Read questions in booklet
   B. Practice coding
   C. Questions?
   D. Collect answer sheets

IV. Work sample (10 minutes) and scoring

V. Explanation of incentive system (Groups 1-5)
   A. Hourly wage ($4.40)
   B. Standard (5.75 per hour, 23 per day)
   C. Incentive concept
   D. Chart (change chart for each group)
      1. Possible production rate
      2. Percent of standard
      3. Wage
      4. Incentive pay
      5. Daily earnings
   E. Formula
   F. Questions?

VI. Note on Efficiency Report (Groups 1-5)

VII. Instruction for Groups 6 and 7
   A. Explanation of standard, no incentive
   B. No explanation of standard or incentive

VIII. Note on Efficiency Report (Groups 6 and 7)

IX. Review of Rules of Work
   A. Parking
   B. Work hours
   C. Tardy/Absent (call 265-6253)
   D. Food and drink
   E. Breaks
   F. Time cards
   G. Sequence of questions
   H. Corrections
   I. Marks and smudges
   J. Multiple answers
   K. No answers
   L. Completed questionnaires
   M. Talking
   N. Bent answers sheets
   O. Pencils

X. First questionnaires

XI. Explanation of Efficiency Report (Groups 1-5)
   A. ID #
   B. Day
   C. QS COMP: do not leave partially coded questionnaires
   D. PHRS = actual work time (less training and Navy questions)
   E. Q/HR
   F. % ERR
      1. Double coding
      2. Small number tolerated (2%)
   G. % PERF EFF
      1. 100% = standard
      2. 100% + incentive = extra pay
   H. THRS = total time less late, absence, early departure
   I. Earnings = $4.40 per hour
   J. Incentive pay (different for each group)
   K. Total pay

SUPERVISOR'S SCRIPT

Introduction

Welcome. My name is _____ and I will be your supervisor for this week. As you may know, this is a temporary summer job. The Navy needs to have a large numger of these Fleet Experience Questionnaires (hold up example) coded on to a standardized answer sheet (hold up example) so the answers can be machine-scored and analyzed. The SDSU Foundation has contracted with the Navy to complete the coding. You have been hired to do the job. You will not be answering the questions on the questionnaire yourself. The questionnaires have already been filled out by Navy personnel. Your job, if you continue for the rest of the week, will be to transfer the answers in the questionnaire booklet on to this standardized answer sheet. In addition to the coding task, we have consented to allow the Navy to ask you some questions about your job. Some researchers from the Navy who are doing research on employee reactions to a variety of jobs will be here later to do this. While we encourage your cooperation with them in their research, your participation is voluntary and will not affect your employment with us. We will not be receiving any of your answers to the questions they ask.

Roll Call

Housekeeping

1) Time cards and time keeping

2) Parking

3) Paychecks: checks mailed on the 26th (Week 1) and August 9 (Week 2)

4) Dismiss low scorers and late registrants, friends, etc.

5) Assign employee numbers

Training and Practice Session

We need to do a number of things today before you actually begin your job. First, we would like to train you for the work and give you some time to practice and ask questions. After you have gained some proficiency with the job, we will be conducting what we call a "work sample." We will ask you to perform the job for a period of time. How well you do will determine whether you will be hired on for the rest of the week or be let go. If your performance shows that you would have difficulty with this task, or if you decide that you don't want to continue, you will be paid for your 4 hours today and be excused from additional work. So, please do your best during the training and work sample session; we would like to retain all of you. Remember, you are not taking a test, you are coding the answers others have given on these questionaires.

Training

It is very important that the task you will be asked to perform be done neatly, accurately, and quickly. Sloppy coding can't be read by the computer or will be recorded as an error and slow work is expensive.

The Fleet Experience Questionnaire is a set of questions which are asked of all first-term Navy personnel in an effort to determine the attitudes of Navy personnel toward their fleet experiences. Open your sample questionnaire to the first page (sample questionnaire, answer sheets, and pencils should be provided at this time or in advance). There are 190 questions which are organized into eight parts. Parts I and II are on the first page and the information from these questions will be coded on Side Two (the back) of your answer sheet. Please turn your answer sheet over to Side Two. Now turn your answer sheet so it is facing this way (show example on poster or overhead transparency).

The first thing you want to do is enter the day and your identification number in the space labeled "identification number" in the lower left hand box (point to box). Write in the work day (Day 1, 2, 3, etc.) in the first space in the bubbles which correspond to these numbers. This information should be entered with a black lead pencil (# 2 1/2 or softer). Please use the pencil that we provide and under no circumstances should you use ink or felt tip pens. Be sure the bubbles are filled in completely (refer to example on side one). This number is your employee identification number for the rest of the week. Please use this number on all of your work and please sit at this work station every day you are here to make my job of keeping track of work hours and job performance manageable.

The next thing you want to do is code the information from question #2 on the questionnaire booklet. You will not be coding questions 1 and 3, but the six numbers on question 2 must be recorded on the answer sheet. These six numbers will go in the area labeled "special codes" just to the left of your I.D. number and just below where it says "sex" (point to area). Again, write the numbers in the blank spaces at the top and fill in the bubbles which correspond to these six numbers.

Now it is time to learn to code the information for questions 4-15 in Part II. This information goes in the box in the upper left hand portion of the answer sheet (Side Two). In the blank spaces labeled "name" you must write in the numbers 4-15, on number in each box (show how this is done on a transparency or poster). Now, for each question you want to fill in the bubble which corresponds to the answer given for that question. For example, if on question #4 the person put "C" as an answer, then fill in the bubble labeled "C." Do the same for the rest of the questions up to #15.

The rest of the questions (16-190) for Parts III through VIII are to be coded on to the rest of the answer sheet. Turn your answer sheet over to Side One and face it this way (show how answer sheet is placed). Begin question #16 on line #16 of the answer sheet (point to line #16). For questions #16-190 the person answering the questionnaire will be making one of five choices (A, B, C, D, or E). You must fill in the correct bubble for each question. Remember, it is important that you be neat and not make any errors. The following rules should be followed to ensure that the answer sheets are completed properly:

1) Be careful not to answer questions out of sequence. It is easy to get off by one or two questions if you are not careful. Be sure to begin on line #16 when filling out Parts III-VIII (page 2 on). Please note that the columns on the answer sheet are not numbered consecutively all the way down to the bottom of the sheet. The numbers go half way down the sheet and then continue on to the next column. For example, line 16 begins in the middle of the second column and line 20 is the last line in that column. Line 21 then begins at the top of the column three. The first 60 lines are located in the top portion of the answer sheet and, likewise, lines 61-120 are located on the bottom portion. The same situation exists on Side Two of the answer sheet, with lines 121-180 on the top portion and 181-240 on the bottom portion.

2) If you make an error, please erase your mistake thoroughly before entering your correction.

3) Avoid stray marks and smudges on your answer sheet.

4) Under no circumstances should you have more than one answer for any given question. If your questionnaire has more than one response for a question or you can't figure out the answer, then you should leave the question blank.

5) If the questionnaire has no answer to a given question, please leave the question blank.

To help streamline the work, we have established the following procedures:

1) You will be provided with a stack of questionnaire booklets and answer sheets. If you run low, I will bring you more so you will not have to move from your work station.

2) You will be provided with several pencils at your work station. If the lead breaks you will have another pencil available so you can continue working.

3) After you have completed a questionnaire, please place the answer sheet inside the questionnaire booklet and set the completed work in front of you. I will collect the completed work from time to time.

4) If you want to talk to your co-workers, please talk quietly so you do not disturb the others who are still working.

5) Feel free to take a break at any time if you need to stand up, stretch your legs, get some refreshments, or go to the rest room.

6) Please be careful not to bend the answer sheets--they are machine-read.

Are there any questions?

Practice

Now, I would like to give you an opportunity to practice the task before we actually have you perform a work sample. Take a few minutes to read through the questions in the questionnaire booklet so you will have an idea of the kinds of questions

asked. After you have looked through the booklet, please begin coding the questions. I will go from station to statsion to observe how you are doing. If you have questions during this practice session, please raise your hand and I will come to your station.

Ready? You can begin.

(Give three questionnaires for practice.)

Are there any questions?

Work Sample

If everyone has had a chance to complete 3 questionnaires for practice and if there are no further questions, we will now perform the work sample. (Collect practice questionnaire answer sheets.) Please work as quickly as you can while at the same time doing a neat job and avoiding errors. (Check to make sure that there are no blanks on the questionnaires used.)

You will work for 10 minutes on the same questionnaires you have been precticing on and at the end of that time I will collect your completed work and will evaluate your work for neatness, accuracy, and speed. After I have completed the evaluation of your work I will announce the names of those individuals who will be asked to continue for the remainder of the week.

(After ten minutes collect the work sample, evaluate each, and announce that everyone will be retained unless some fail to reach bubble #142.)

Review of Rules of Work

Let us take a few minutes to review the rules which have been established to make this job run more smoothly:

1) Parking.

2) Work hours are from _____ to _____. Please be here promptly each day you are scheduled to work.

3) If you are going to be late or cannot come to work, please call the SDSU Foundation at 265-6253 as soon as you can to let us know. If you come late, your pay will reflect your actual time on the job.

4) No food or drink should be consumed at your work station.

5) You may take a break from your work any time to go to the rest room, relax, get a snack, etc. We ask that you do not abuse the privilege.

6) Time cards.

7) Be careful not to code the questions out of sequence.

8) Erase any errors completely before making corrections.

9) Avoid stray marks and smudges on answer sheet.

10) Do not code more than one answer for any question on the answer sheet.

11) Leave question blank if there is no answer given on the questionnaire.

12) Place the answer sheet inside the completed questionnaire and place both in front of you.

13) If you talk at your work station talk softly so as not to disturb others.

14) Do not bend answer sheets.

15) Please use the pencils we provide.

Administration of First Questionnaire

Before we actually begin the job of coding the Fleet Experience Questionnaires, some folks from the Navy want to ask a few questions about yourself and your opinions about work. The Navy is interested in this information because they want to compare people's responses from different work situations and want to know how to improve work and working conditions. A researcher from the Navy is here today to collect this information. We at the foundation will not see this information.

(Note that participation will not penalize them in the amount of incentive they can earn. In fact it may help them.)

Explanation of Incentive System Group ____

When you signed up for this work you were told that you would be paid $4.40 per hour. You will receive this wage regardless of how many questionnaires you complete per hour. However, since the foundation is concerned with accomplishing this task as quickly as possible, a wage incentive system has been developed to reward people who do a good job. We have been authorized to set up different payment systems to see which method works best. You have been assigned to this group on a random basis. For your job the average worker performing under normal conditions should be able to code about 5.75 questionnaires per hour (23 per day). As an incentive to do a better job, we will pay you extra for each additional questionnaire that you complete above this standard rate. Here is how the system works.

The chart gives some examples of how you can earn extra money by working aobve the standard rate.

1) The first column gives some examples of possible production rates, i.e., questionnaires per hour. In the first instance (5.75) the rate is right at standard. The others range from slightly above standard to well above standard.

2) The second column indicates the exact percent of the standard rate for each of the numbers in the first column. For example, the figure 5.75 is 100% of standard, the figure 6 is abour 104% of standard, and the figure 12 is over 200% of standard.

3) The third column simply shows your daily pay for 4 hours at $4.40 per hour.

4) The fourth column shows the incentive pay (extra pay) you will receive if you work above standard. For example, if you code 6 questionnaires per hour on a particular day you will receive an additional _____ at the end of the day. If you work even harder and code 12 questionnaires per hour then you will receive an extra _____ for the day.

5) The last column shows how much you can earn each day by adding your daily pay to your incentive pay and in parentheses the equivalent hourly pay. (Point out examples. That rate applies to the day achieved only.)

If you would like to keep track of your incentive pay, you can use this formula (point to formula on blackboard) to compute your earnings. (The formula will differ for each incentive condition.)

Are there any questions?

Note on Efficiency Report

At the end of each day I will collect your completed work and deliver it to a computer. The computer will count the answer sheets and compare the answers on your sheet with the answers of another person who has also coded the questionnaire. This will allow us to verify the answers and compute an error rate. An "efficiency report" will then be printed out to show you how you are doing and will be given you the next day.

(Provide explanation with first report on Tuesday.)

Explanation of Efficiency Report (Groups 1-5)

Here is the report I mentioned yesterday. Each of you is identified by your employee identification number which appears in the column marked "ID #."

1) The next column ("Day") shows the work day for the report. Today (Tuesday) you have a report which has information on how your performed yesterday (Monday). On Wednesday you will receive the report for today and so on.

2) The next column to the right ("QS COMP") will show you how many questionnaires you completed the previous days you worked. You will only get credit for completed questionnaires, so do not leave a questionnaire partially coded at the end of the day.

3) The next column ("PHRS") shows you how many "production hours" you worked that day. These are the hours you were actually assigned to be working on coding questionnaires. Time spent answering questions for the Navy and training time will not be counted as production hours.

4) The column labeled "Q/HR" refers to the number of questionnaires you completed per production hour. This column is the number of questionnaires completed per day (column QS COMP) divided by the production hours (column PHRS). The standard rate is 5.75 Q/HR and you will receive extra pay if you work at a higher rate.

5) The "% ERR" column tells you how many errors were made on that day. The Navy is very concerned about errors and so we have developed a system for detecting errors. Each questionnaire booklet will be coded twice, once by you and again by someone else. Whenever the computer finds a discrepancy between two questions it records an error. The % ERR column is the percentage of questions which do not agree between the two codings. A small number of errors can be tolerated, but we want you to keep your error rate at no more than 2%. If there are too many errors then I will check your work more closely and correct the situation.

6) The column labeled "% PERF EFF" tells you how well you are doing compared to the standard rate of performance. If you are able to do 5.75 per hour then you are working at the standard rate and you are 100% efficient (refer to example). If you work at a rate faster than 5.75 questionnaires per hour, then you are doing better than the standard and are over 100% efficient. If you are more than 100% efficient then you will be rewarded by receiving extra pay.

7) The next column ("THRS") refers to the total time actually on the job. Late time, early departures, and absences will be subtracted from the total hours.

8) The "EARNINGS" column refers to the amount you earn at $4.40 per hour for four hours per day.

9) The "INCENTIVE PAY" column shows the amount you will earn if you work faster than the standard rate. This money is added to your earnings and will increase your total pay.

10) The "TOTAL PAY" column is simply your earnings plus your incentive pay for that day.

Are there any questions?

Alternative Instructions for Nonincentive Groups (Groups 6 and 7)

Group 6: Feedback for Standard, No Incentive

When you signed up for this work you were told that you would be paid $4.40 per hour. You will receive this wage regardless of how many questionnaires you complete per hour. We have been authorized to set up different payment systems to see which method works best. For your job the average worker performing under normal conditions should be able to code about 5.75 questionnaires per hour (23 per day).

Group 7: Feedback on Performance, No Standard or Incentive

When you signed up for this work you were told that you would be paid $4.40 per hour. You will receive this wage regardless of how many questionnaires you complete per hour. We have been authorized to set up different payment systems to see which method works best. You have been assigned to this group on a random basis.

Note on Efficiency Report (for Both Groups 6 and 7)

At the end of each day I will collect your completed work and deliver it to a computer. The computer will count the answer sheets and compare the answers on your

sheet with the answers of another person who has also coded the questionnaire. This will allow us to verify the answers and compute an error rate. An "efficiency report" will then be printed out to show you how you are doing and will be given to you the next day. (Provide explanation with first report on Tuesday.)

APPENDIX E

FACTOR ANALYSIS ROTATED FACTOR MATRICES

Table E-1

Varimax Rotated Factor Matrix
Derived from Job Satisfaction Scale

Item	Factor			
	I	II	III	IV
1	.00	.03	.08	.40[a]
2	-.06	.81[a]	.22	.13
3	.12	.09	.82[a]	.07
4	.09	.15	.47[a]	.00
5	-.06	.15	.00	.42[a]
6	.08	.81[a]	.12	-.03
7	.02	.59[a]	.07	.11
8	.53[a]	.01	.14	-.22
9	.10	.57[a]	-.01	.07
10	.76[a]	.04	.15	-.18
11	.15	.03	.60[a]	.22
12	.05	.01	.10	.69[a]
13	.80[a]	-.05	-.05	.02
14	.64[a]	.22	.19	.06
15	.63[a]	.09	.15	.15
16	.48[a]	-.01	.02	.05

[a]Item included in factor scale.

Table E-2

Varimax Rotated Factor Matrix
Derived from Perceived Stress Scale

Item	Factor					
	I	II	III	IV	V	VI
1	-.14	-.10	-.41[b]	-.14	.10	.06
2	-.24	.37[a]	-.27	.12	.13	.09
3	-.02	.01	-.09	.03	.43[c]	.34[c]
4	-.14	-.02	-.35[b]	.11	.06	.17
5	-.06	-.16	-.15	.08	.10	.35[a]
6	.21	-.07	-.11	.10	-.03	.51[a]
7	.04	.78[a]	.04	.08	.02	.09
8	-.11	.77[a]	.15	.02	.00	-.10
9	-.05	.09	.25	.08	.10	.45[a]
10	.07	.45[a]	.06	.13	.11	-.05
11	-.06	.13	-.15	.06	.14	.41[a]
12	-.22	.45[a]	.06	.20	.27	.05
13	-.07	-.13	.72[a]	.08	.19	-.17
14	.05	.06	.79[a]	.04	-.06	.10
15	-.07	.28	.09	.92[a]	.15	.10
16	.03	.14	.06	.82[a]	.10	.10
17	.65[a]	-.10	.20	-.12	.12	.12
18	.23	.19	-.13	.20	.39[a]	.00
19	.83[a]	.03	.01	.02	.03	.00
20	.05	.06	.12	-.02	.63[a]	.20
21	.79[a]	-.08	.13	.07	.21	.12
22	.25	.18	-.11	.20	.78[a]	.00

[a]Item included in factor scale.
[b]Item excluded due to effect on scale reliability.
[c]Item included in two scales.

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